Interpretive diversions: components, context and consequences of interpretive diversity and organizational learning

Krepapa, Areti

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INTERPRETIVE DIVERSIONS:

COMPONENTS, CONTEXT AND CONSEQUENCES OF

INTERPRETIVE DIVERSITY AND ORGANIZATIONAL LEARNING

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ARETI KREPAPA

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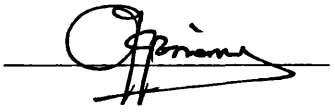

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For my P^2s, with love and appreciation.

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ABSTRACT

Recent years have witnessed a renewed interest in organizational learning and the management of its processes. Most empirical and conceptual research in this area identifies the interpretation of information as a key component of organizational learning, but fails to fully explicate this central phenomenon. As a result, our understanding of the organizational processes through which market information is given meaning is still limited. This is despite the growing concern of the business and academic community over organizational weaknesses in interpreting and acting upon the contemporary information tsunami. The study addresses the problem of interpretation efficiency by focusing on the following research question: "What are the components, contextual antecedents, and marketing consequences of an interpretation-driven approach to the organizational learning process?" To this end, the thesis (1) identifies interpretation of market information as the central phenomenon of the organizational learning process and investigates it at the collective decision-making level; (2) introduces the concept of interpretive diversity and develops a theoretical framework for its study in relation to the learning sub-processes of scanning and adaptation; (3) develops a conceptual model of the organizational context antecedents and marketing decision consequences of the learning sub-processes, i.e., scanning, unified diversity, and adaptation; (4) empirically investigates the model using a sample of 239 strategic marketing decisions from top UK firms; (5) discusses the implications of the study results for theory and practice; and (6) concludes with a set of directions for further research on organizational learning and interpretation.

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Ultimately, a dissertation is a creative piece of writing and as with all invented stories, it also entails two fundamental ingredients: the plot and the characters. As far as the plot is concerned, well, I have to admit that this thesis attempted far too much and that I have been warned. But I have also read that training academics is like training cats – in the end we pursue our own ideas with a great degree of feline independence and incomprehension. The characters are a different matter altogether. In this type of narrative they are tacit and unseen, yet they were unmistakably present in every step of the way, playing a primary role in helping, teaching, encouraging, and supporting. These are the central characters in my three-year story:

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INTRODUCTION

INTRODUCTION

> *"Meno...see what a tiresome dispute you are introducing. You argue that a man cannot enquire about that which he knows, or about that which he does not know; for if he knows, he has no need to enquire; and if not, he cannot; for he does not know the very subject about he is to enquire."*
>
> - Plato
> Meno (380 B.C.)

The learning process has come to be viewed as an increasingly important area for conceptual and empirical research in light of its implications for organizational performance. Although the concept of organizational learning has been studied from a variety of theoretical perspectives, most conceptual and empirical research is rooted in the assumption that decision-makers ascribe meaning to complex information, producing interpretations, that are associated with different organizational actions and firm performance implications (Thomas, Clark, and Gioia 1993; Daft and Weick 1984; Weick 1979). Given that strategic marketing decisions are a function of the information received and processed (e.g. Moorman 1995; O'Reilly 1983; Pfeffer and Salancik 1978), information interpretation and the ability to learn are considered vital to sound marketing decision-making. Despite recent contributions to both the management literature (e.g. Crossan, Lane, and White 1999; Corner, Kinicki, and Keats 1994) and the marketing literature (eg. Baker and Sinkula 1999; Sinkula, Baker, and Noordewier 1997; Moorman 1995) our current understanding of a primary construct in the learning process, interpretation of information, is still limited because the process of interpretation in organizations is complex, multilevel and difficult to measure.

Yet the subject seems to be more topical now than ever before. The ongoing developments in information technology are making vast amounts of market data available to managers: "*With the advent of scanner panel data, brand managers receive millions of bits of information pertaining to their brand every week, and direct marketers can assemble immense databases*" (Day and Montgomery 1999: 10). However, a key question for firms is whether this data explosion is matched by an ability to digest all the information and make successful marketing decisions. Feldman and March (1981) note that managers gather information ostensibly for decisions yet they do not use it: "*In short, most organizations and individuals often collect more information than they use or can reasonably expect to use in the making of decisions. At the same*

time, they appear to be constantly needing or requesting more information, or complaining about inadequacies of information" (p.174). In other words, although managers often assume that greater information availability makes the task of effectively responding to market challenges considerably easier, this does not seem to be the case (Bettis and Prahalad 1995). "*What is seen instead is information-rich but interpretation-poor systems*" (Bettis and Prahalad 1995: 6). The present thesis addresses this eminent problem by attending to the following research question: "What are (1) the components, (2) contextual antecedents, and (3) consequences of an interpretation-driven approach to the organizational learning process?"

Building on the Daft and Weick (1984) theory of organizations as interpretive systems, this study identifies interpretation of information as the central phenomenon of the learning process and investigates it at the collective decision-making level. It is argued that the context in which decision-makers interact and the interpretations of market information they create during the decision-making process are expected to have a potent effect on the effectiveness of their marketing decisions (Dooley and Fryxell 1999; Schweiger and Sandberg 1991). It is further argued that because making strategic marketing decisions is a process involving a number of managers and departments (e.g., Franwick, Ward, Hutt and Reingen 1994), diversity in the interpretations of market information is likely to occur, which in turn influences decision outcomes.

Although there is a substantial body of conceptual and empirical research on the relationship between cognition and performance (e.g. Rajagopalan and Spreitzer 1999; Thomas et al.1993) and on the effects of antecedent and contextual factors on interpretation of strategic issues (e.g., Denison, Dutton, Kahn and Hart 1996;Thomas and McDaniel 1990; Daft and Weick 1984), no systematic, integrating model delineating the interrelationships between organizational context, the learning process and decision making outcomes at the organizational level has been presented. Moreover, although there have been studies focusing on the impact of diversity on learning and performance, these studies have focused either on the content and framing of the *communication* of issues (Fiol 1994) or on the cognitive diversity of *strategic issues* (e.g. Miller, Burke, and Glick 1998), rather than on *information per se.*

The study addresses this opportunity by (1) suggesting an alternate typology of market information interpretation, which is based on Fiol's (1994) content and framing

distinction and (2) proposing an integrated framework of the key organizational antecedents and decision-related outcomes of the overall learning process.

The thesis is presented in nine chapters. In the first chapter, an overview of the theoretical background and the learning process is discussed and the premises underlying the study are presented. Then, in the second chapter, the concept of information interpretation is explicated and the construct of *interpretive diversity* is introduced to explain the variation in decision-related outcomes. In the third chapter, a conceptual model of the organizational context antecedents and decision consequences of the learning process is developed and research hypotheses are outlined. The research design and the methodology employed to test the model are discussed in chapter 4, followed by the data analysis in chapters 5, 6, and 7. Chapter 8 involves the in-depth discussion of the research results. Chapter 9 attends to the study's theoretical and managerial implications, the research limitations, and directions for future research. Finally, the epilogue entails the synopsis of the thesis and the major conclusions drawn from this work.

CHAPTER 1

CONCEPTUAL BACKGROUND

CHAPTER 1

CONCEPTUAL BACKGROUND

"An organization is a body of thought thought by thinking thinkers"

- Karl Weick
Cognitive Processes in Organizations (1979)

The domain of organizational learning is vast and has been discussed in a number of different fields for over 30 years. There is rarely agreement within disciplines as to what learning is or how it occurs, let alone agreement between disciplines (Fiol and Lyles 1985; Dodgson 1993). With this in mind, the objective of the first chapter is to present the basic theoretical roots of organizational learning, with a view to explicate the adopted perspective of this study and the corresponding research problem. The chapter is set out as follows. First, the theoretical background of learning in organizations is presented. Second, the core constructs of learning are delineated and the relevant conceptual perspectives discussed. Third, the fundamental question of the thesis is articulated and finally, the assumptions that underpin the conceptual framework of the study are set out.

1.1 Learning and Organizations

Why do organizations learn? Although an apparently simple question, it has more facets than it would first appear, for it is based upon a contentious belief and it produces complex answers. For one thing, it implicitly assumes that organizations *do* in fact learn, whether they consciously choose to or not. This assumption is based on the fact that all complex, adaptive systems - be it economies, minds, or organisms - tend to build models that allow them to anticipate the world (Holland 1992). In a metaphorical sense, an organization is seen to learn the way that individuals do, which also implies that learning is as inevitable in organizations as it is in individuals (e.g Dodgson 1993).

Current thinking in management and organization theory emphasizes three distinct areas upon which the rationale for organizational learning is grounded: adaptation to the environment, generation of knowledge, and decision-making.

First, organizations need to learn in order to successfully survive in their environments. Organizational learning is seen as a purposive quest to retain and improve

competitiveness, productivity, and innovativeness in times of change (e.g. Dixon 1999; Dodgson 1993). Using a formula borrowed from ecology - $L \geq C$ - Revans (1980) notes that in order to survive, an organism must be able to learn (L) at a rate that equals or exceeds the changes (C) that are occurring in its environment. It follows that organizations, as systems, must increase their capacity to learn if they are to operate successfully in an environment characterized by swift market and technological changes, rapid globalization, and intense competition (Day 1994; Slater and Narver 1995). For marketing tasks in particular, Sinkula (1994) notes that it is critical for organizations not only to keep track of how much they learn but also how long it takes them, as "*the rate at which individuals and organizations learn may become the only sustainable competitive advantage*' (Stata 1989:64).

Second, organizations employ learning in order to generate new knowledge. Argyris and Schön (1978) suggest that an organization is, at its root, a cognitive enterprise that learns and develops knowledge. In the knowledge-based view of the firm, the primary rationale for the organization is the creation and application of knowledge (Spender 1996; Grant 1996). The knowledge structure serves to define behaviours, choices, and actions for organizational members. According to Drucker 1993), "*the right role for management is to ensure the application and performance of knowledge, that is, the application of knowledge to knowledge*" (p.45). Performance differences between firms are then seen as a result of their different knowledge bases and capabilities in developing and deploying knowledge. In this sense, organizational learning is considered as a major source of competitive advantage because of the inherent complexity and imitation difficulty involved in the knowledge creation and application processes (Day 1994).

The third arena of organizational learning concerns strategic decision-making. One of the major functions of organizational learning is that it links managerial cognition and strategic action (e.g. Crossan et al. 1999). According to Argyris and Schön (1978), an organization learns by constructing, testing, and restructuring its theories of action. Learning thus becomes a process through which organizational members develop both an ability to discover when strategic actions are required, as well as what actions can be undertaken to improve performance and to master the environment (Duncan and Weiss 1979). In this sense, learning encompasses the processes whereby strategic decisions/actions are developed within a context of meaning (e.g. Quinn 1980) and are subsequently used to alter the environment (e.g. Hedberg 1981).

1.2 The Core Concepts: Knowledge, Information and Learning

The literature has consistently linked the three modes in which firms use organizational learning, to three corresponding core constructs: Adaptation in the environment is seen to take place through a *learning process* (e.g. Daft and Weick 1984; Huber 1991). Knowledge creation has been linked to a process of *knowledge conversion,* i.e., of converting tacit to explicit knowledge[1] (e.g. Nonaka and Takeuchi 1995). Decision-making has been traditionally linked to *information processing* (e.g. Howard, Hulbert, and Farley 1975; Pfeffer and Salancick 1978). A problem, however, lies with the fact that the three underlying constructs, i.e., learning, knowledge and information, are often treated as theoretically overlapping concepts, used in an unclear fashion.

1.2.1 Information and Knowledge

In the past, the terms "information" and "knowledge" have been employed inconsistently and interchangeably in the literature. Most scholars agree that there is a distinction between the two, although what exactly constitutes "information" and "knowledge" is not made clear, for few explicitly differentiate and define the constructs. This is not surprising, given the fact that the definition of "knowledge" has been a contentious topic among philosophers, and later sociologists, for millennia (Havelock 1986). What complicates matters further is the emergence of additional buzzwords in both the popular and academic business literatures, such as knowledge management, learning organization, sense making, data mining, information processing etc., that have been used by scholars and practitioners in many different ways. It is beyond the scope of this thesis to resolve these matters or enter into the argument of what knowledge is. Rather, a utilitarian approach is assumed with a view to identify and adopt a working distinction between the two related terms of "information" and "knowledge".

A review of the relevant literature reveals a tendency to degenerate into tautology: definitions of knowledge sound suspiciously like information and vice versa. Some authors tend to use the two terms interchangeably (e.g. Sinkula 1994; Menon and Varadarajan 1992; Huber 1991; Glazer 1991; Desphandé and Kohli 1989) while others conceptualize information as data (Moorman 1995) or intelligence (Maltz and Kohli

[1] Tacit knowledge is personal, context specific knowledge that resides in the individual and is hard to communicate. Explicit knowledge is more formal codified knowledge conveyed from one person to another in systematic ways (e.g. Polanyi 1983).

1996; Kohli and Jaworski 1990). However, what appears to be common in most conceptualizations is that knowledge lies at a more complex level than information, i.e., information is seen to exist within the larger environment of a collectively held body of knowledge. Consequently, a more pragmatic way of addressing the distinction is by applying the notion of a hierarchy (Allee 1997), in which data, information, and knowledge may be ordered in successive levels of complexity. At the lowest level of the hierarchy is *data*: facts or inputs with little independent meaning; at the next level lies *information*: data that have been ordered, structured or linked with other data; at a higher level is *knowledge*: a collection of information that has been assigned with meaning. What differentiates knowledge from information is that: "*Knowledge resides in the user and not in the collection. It is how the user reacts to a collection of information that matters*" (Churchman 1971:10). This distinction between information and knowledge is not much less ambiguous, because in reality we can never separate the user from the information; the values, assumptions, and beliefs always determine what information the user pays attention to and regards as relevant. So, what actually changes is the level of meaning and cognitive effort associated with each level of the hierarchy. Yet the need for clear conceptualizations in a study of learning and interpretation suggests that we can only but acknowledge this equivocality and proceed with adopting a working, yet admittedly simplistic, distinction between the two terms. Thus, *market information* is used when referring to structured data placed in a specific context, i.e., organized data about a firm's market. In contrast, the term *knowledge* is employed when referring to information that has been analyzed, endowed with meaning, and compared to what is already known.

But how are the two related to learning? The extant literature has consistently conceptualized the underlying processes by which organizations learn through interaction with their environments, update their knowledge bases, and make decisions, as a series of information processes. Information processing is thought to be a necessary condition for learning because, essentially, learning "*is the process by which information is transformed to knowledge*" (Sinkula et al. 1997: 308).

1.2.2 Approaches to Learning

Researchers have developed a number of models to describe the way that managers and organizations deal with information and act to influence organizational outcomes.

Various perspectives have been documented in literatures concerned with organizational learning (Sinkula et al. 1997; Day 1994; Huber 1991; Fiol and Lyles 1985; Argyris and Schön, 1978), organizational adaptation (Milliken 1990), interpretation systems (Daft and Weick 1984) information utilization (Menon and Varadarajan 1992; Desphandé 1982; Desphandé and Zaltman 1982, 1984), market information processing (Moorman 1995), diffusion of innovations (Rogers 1983; Zaltman 1986), and the sociology of science (AMA Task Force 1988). Although there exists widespread acceptance of the notion of a learning process in organizations and its importance in strategic performance, no theory or model of organizational learning is widely accepted (Fiol and Lyles 1985; Dixon 1992). Depending on their perspective, scholars have provided different definitions of organizational learning:

> Organizational learning means the process of improving actions through better knowledge and understanding (Fiol and Lyles 1985).
>
> An entity learns if, through its processing of information, the range of its potential behaviors is changed (Huber 1991).
>
> Organizational learning is a process of detecting and correcting error (Argyris and Schön 1978).
>
> Organizational learning is the development of new knowledge or insights that have the potential to influence behavior (Slater and Narver 1995).
>
> A learning organization is as an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights (Garvin 1993).

➢ **Marketing Perspectives**

In the marketing discipline research has historically focused on the utilization of market information in organizations. Better and effective use of market information is seen as critical to becoming market oriented and to succeeding in an intensely competitive business environment (Menon and Varadarajan 1992). There have been several studies exploring the nature of marketing information use in organizations, as well as the role of organizational and informational factors in the utilization of information by marketing managers (e.g. Menon and Varadarajan 1992; John and Martin 1984; Desphandé 1982; Desphandé and Zaltman 1982, 1984). However, recent contributions to the literature

(Moorman and Miner 1997; Moorman 1995; Sinkula 1994; Day 1994) suggest that although previous research has provided valuable insight into information utilization from the individual manager perspective, marketing should also examine information processes as they occur at the organizational level. This view is primarily influenced by two streams of research: the market orientation literature and a renewed interest in organizational learning. Despite the recent attempts to assimilate organizational learning into marketing (e.g. Hurley and Hult 1998; Hult 1998, Sinkula et al. 1997; Hult and Ferrell 1997; Slater and Narver 1995), there seems to be little agreement as to the definition and measure of the construct, and generally it is conflated with the constructs of market orientation (e.g. Kohli and Jaworski 1990) and market information processing (e.g. Moorman 1995).

Most marketing scholars view organizational learning as a process, a cognitive enterprise, but disagree on other matters: some believe that behavioral change is required (Slater and Narver 1995), while others insist that overt change is not a necessary condition for learning to have occurred (Sinkula 1994). Some emphasize concrete information processing systems (Moorman 1995; Day 1994); others stress the need for mutual mental models, shared organizational visions, and open-minded approaches to problem solving (Senge 1990). The former link organizational learning to knowledge acquisition, the latter to value acquisition (Sinkula et al. 1997).

➢ **Organizational Behavior Perspectives**

"*In the organizational behavior literature learning has been discussed as a cyclical process in which individuals' actions lead to organizational interactions with the environment, the environment responds and environmental responses are interpreted by individuals who learn by updating their beliefs about cause and effect relationships*" (Lee, Courtney, and O'Keefe 1992 cited in Sinkula 1994: 35). The organization's ability to learn from and adapt to the environment extends beyond the individual members' capacity and is seen as a collective activity. Indeed, where learning is concerned, there seems to be a know-how in the collective that can be credited only to the group (Dixon 1992). Daft and Weick (1984:285) also note that, "*...individuals come and go, but organizations preserve knowledge, behaviors, mental maps, norms and values over time. The distinctive feature of organizational level information activity is sharing*". Individual members of the organization share information, creating collective meanings,

which in turn guide individual and organizational actions. Individuals are essential to the development of organizational learning: "*It follows both that there is no organizational learning without individual learning, and that individual learning is a necessary but insufficient condition for organizational learning*" (Argyris and Schön 1978: 20).

1.2.3 Adopted Perspective

In both theoretical streams, i.e., marketing and organizational behavior, there seems to be general consensus on two things: First, the underlying processes by which organizations learn about their environments and update their knowledge bases, can be conceptualized as a series of information processes. Although there is some variance in the specifics, theorists (e.g. Daft and Weick 1984; Moorman 1995; Huber 1991; Dixon 1999; Day 1994; Sinkula et al. 1997) have typically classified four learning-related constructs or sub-processes relating to: information acquisition, knowledge dissemination/integration, interpretation, and action[2].

Second, in both streams there appear to be agreement on the importance of interpretation in the learning process. Because modern organizational environments are characterized by increased information inflows, complexity, and dynamism, a major task for management is to provide meaningful interpretations for patterns of ambiguous market information. "*Those interpretations are often seen as critical to the success and even the survival of organizations, mainly because of their implications for influencing action alternatives and subsequent outcomes*" (Thomas et al. 1993:240). The effectiveness of market information processing and action consequences are seen to be ultimately dependent on the degree to which the mental models employed by managers to interpret market information are indeed accurate representations of reality (Sinkula et al. 1997).

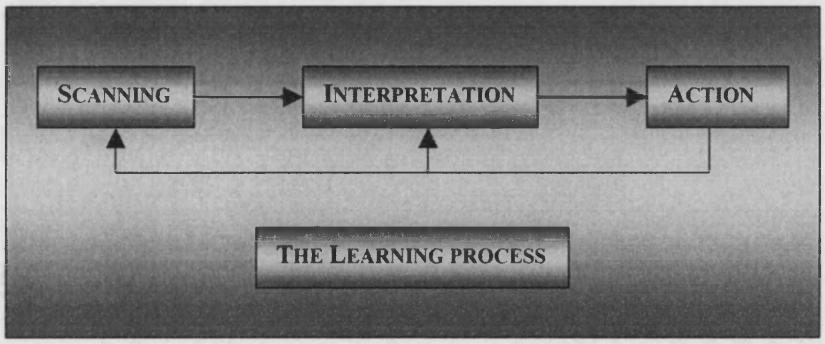
Yet the interpretation process in organizations is neither simple nor well understood and is often confused with concepts such as sense making, conceptual utilization of information, understanding, and learning (e.g. Duncan and Weiss 1979; Moorman 1995; Hedberg 1981; Weick 1979). One of the most influential approaches to interpretation in the literature is proposed by Daft and Weick (1984). In their model of organizations as

[2] In certain models, e.g. Huber (1991), Day (1994), and Sinkula et al. (1997), organizational memory is also seen as being part of organizational learning. However, since here learning is discussed as a process, organizational memory does not fit the sub-process description. Instead, the Hedberg (1981) view is adopted, which looks at information processes as a function of memory.

interpretation systems, the authors untangle the concept of information interpretation and place it at the heart of the learning process (Figure 1.1).

In the their view, the learning process is about organizations scanning the environment for information, creating collective interpretations, and making decisions in response to those interpretations. In turn, the very act of responding to interpretations generates new information and may provide new insights for interpretation. Hence, the three stages in Figure 1.1 are interconnected through a feedback loop.

FIGURE 1.1: THE THREE LEARNING SUB-PROCESSES



Source: Daft and Weick 1984

According to Day (1994), "*recent developments in information technology can deliver more timely and detailed market information, but the ensuing avalanche of numbers often smoothers the collective ability to make sense of the data*" (p.9). Since more market information is neither an answer nor a problem, firms are looking to improve their ways of transforming information into meaningful knowledge. Thus, if knowledge and its management are so important a determinant of firm performance, then the underlying processes that organizations use to make sense of their environments are likely to be a critical area of strategic choice for the firm. Given that the Daft and Weick (1984) model of organizations as interpretation systems explicitly addresses the issue of sensemaking, it forms the basis of this thesis and provides the conceptual foundation upon which interpretation is studied.

1.3 Research Problem: The Interpretation Challenge

Overall, the ability to adapt in a dynamic environment presents a major challenge, for it requires organizations to be skilled at all the underlying processes used to learn about

markets (Day 1994). This means that in order to successfully survive and evolve, firms should aim at constantly improving their processes of scanning, interpreting, and responding to their markets. Improvement of the organizational scanning and action response processes has received a lot of attention in the marketing literature dealing with market orientation (Kohli and Jaworski 1990), market information processing (Moorman 1995), information utilization (Menon and Varadarajan 1992), and market-based organizational learning (Sinkula et al. 1997; Day 1994). It is generally agreed that rigorous organizational information acquisition and knowledge application/response processes are positively related to organizational performance. Yet, although there is sufficient conceptual clarity about the positive impact that these two processes have on performance, this is not the case with the process of information interpretation.

As noted above, interpretation is a process of developing shared meaning and understanding among organizational members. Given, however, the human frailties as information processors, a first problem with interpretation is that the mental models organizational members employ to collectively make sense of their environment may be inaccurate. If this is the case, how does one improve interpretations in an organization? What does the concept of a "better" or "more accurate" collective interpretation mean? Following from these questions, a second problem is that different organizational members are likely to interpret incoming information in different ways. In view of that, Huber (1991) asks a very interesting question: *"Do these definitions [of interpretation] imply that, if all organizational units develop a common interpretation about an item of information, then more organizational learning has occurred? Or has more organizational learning occurred if all units interpret the information differently?"* (p.102).

This thesis seeks to empirically address these questions. This is done by introducing the concept of *interpretive diversity*, which refers to the extent to which members of an organization develop different interpretations of the market information collected, and by investigating its effects on marketing decision outcomes. In addition to this, a central tenet of the thesis is that scanning, interpretive diversity, and action are highly interconnected processes and that by understanding how they operate at the organizational level, a holistic view of the learning process emerges (e.g. Daft and Weick 1984). However, so far there is little understanding of the organizational context that can enhance the learning process. Moreover, although there is a body of research

linking learning to performance, there have been no studies examining the link between learning and decision outcomes, even though the constructs of organizational learning and decision-making are inherently related (e.g. Corner et al. 1994; Choo 1998). Following from this, a second objective is to develop and test a model of the organizational context antecedents and marketing decision consequences of the three learning sub-processes proposed by Daft and Weick (1984).

1.4 Underlying Assumptions

As Daft and Weick (1984) note, "*any approach to the study of organizations is built on specific assumptions about the nature of organizations and how they are designed and function*" (p.285). Six premises underlie the framework presented in this study and are discussed in turn below:

Premise 1: Learning occurs collectively, is instrumental and analyzable.

As noted in the beginning of the chapter, the most fundamental assumption of this thesis is that organizations learn collectively. By building on the metaphor of individual learning, organizational learning can be seen as natural as learning is in individuals as they attempt to adjust and survive in an uncertain world (Dodgson 1993). Schön (1979) makes an interesting point on the transition from individual to organizational learning: "*Intelligent action depends on a continuing mutual adjustment of individual behaviors, one to another. Their organizing depends, in turn, on each person's image of the larger system*" (p.117). Hence, although it is individual members who learn and act, they do so "*...for the collectivity by virtue of the rules for decision, delegation, and membership*" (Argyris and Schön 1978: 13).

This brings us to the second point that collective learning not only occurs in organizations, but is also instrumental. Dixon (1992) notes that organizations are created because a task is too large and complex for one individual: "*To accomplish this greater task each individual within the organization must have a level of competence, but, likewise, the organization as a whole must have a competence. Organizations are not created with such organizational competence intact; the concept of organizational learning implies that organizations must learn in order to compete successfully*" (p.32).

Thus, an organization is seen as a system that develops mental functions analogous to those in individuals, which are reflected in processes purposefully developed to facilitate learning in rapidly changing and uncertain conditions (e.g. Dodgson 1993). It follows from this, that organizational learning is analyzable, i.e., it can be broken down into and studied as a series of sub-processes.

Premise 2: Strategic decision-making is an outcome of learning.

A second basic assumption is that organizations are open social systems that process information from the environment and initiate decision-making processes in response to information interpretation. In the decision-making perspective, for a decision to be successful, appropriate information about the environment and possible consequences of alternative actions must be acquired, processed, and utilized by decision makers (Pfeffer and Salancik, 1978; Hulbert 1981; Farley, Hulbert, and Weinstein 1980)). Although according to the rational model of decision-making, information processing is precipitated by the recognition of a problem and followed by the selection of a course of action, here strategic decisions are seen as outcomes of complex sensemaking processes (e.g. Corner et al. 1994; Quinn 1980). In this view, decisions are seen as emergent phenomena (e.g. Mintzberg 1978) rather than rationally constructed choices. In this sense the central concern is with understanding how managers in organizations construct meaning and then, exploring how that reality provides a context for organizational action, including decision-making.

Premise 3: Strategic marketing decisions are made collectively.

Because of the complexity of strategic problems and the uncertainty associated with the organization's environment, it is typically groups of managers rather than individuals that address strategic marketing decisions. The emerging strategic management perspective depicts strategic decisions as disorderly and disjoined processes in which a number of managers from different functional areas and at different hierarchical levels interact to make decisions (Mintzberg, Raisinghani, and Theoret 1976; Walsh, Henderson, and Deighton 1988; Wooldridge and Floyd 1990; Franwick et al. 1994). Strategic marketing decisions are seen as outcomes of interplay and negotiation with other individuals or functional units (Franwick et al. 1994). The group processes are important not only for evaluating and ordering ambiguous information during decision

making, but also for ensuing inferences and recommendations and gaining commitment to decisions among individuals who will ultimately be responsible for implementing them (Schweiger, Sandberg, and Ragan 1986).

Premise 4: Organizational interpretation can be meaningfully studied at the top management level.

Although a number of organizational members may play a significant part in gathering, analyzing, and disseminating information about the organization's environment, the process of interpretation for organizational action is thought to take place primarily at the top. "*Upper managers bring together and interpret information for the system as a whole*" (Daft and Weick 1984: 285). Because the cognitive capabilities of an organization's upper echelon are reflected in the organization's actions (e.g. Hambrick and Mason 1984), it is assumed that the organizational interpretation process can be meaningfully studied at the upper management level.

Premise 5: Organized action occurs despite divergence in interpretations.

In the organizational behavior literature there have been two perspectives of how groups come to take organized action (Donnellon, Gray, and Bougon 1986). In the first view, "*organization members act in a co-ordinated fashion as a result of sharing a common sense of meanings or interpretations of their joint experience*" (Donnellon et al. 1986:43). In other words, organized action is seen as the product of consensus among decision-makers. However, according to the second perspective it is not necessary that members share the same interpretations in order for organized action to occur (Weick 1979). Although members need a minimal degree of shared understanding about the nature of the task and the rules governing it, there is no guarantee that the individual interpretations produced will coincide. The premise underlying this thesis is in line with the second perspective. Although "*reaching convergence among members characterizes the act of organizing and enables the organization to interpret as a system*" (Daft and Weick 1984:285), members need not agree on their interpretations of information. On the contrary, this thesis argues that it is the diversity in interpretations that leads to creative action.

Premise 6: The learning process is a function of the organizational context.

Not only will differences in interpretations within an organization exist, but also differences in the capabilities of producing multiple interpretations among different organizations will exist. The last premise of the thesis is that the way organization processes information about its environment is likely to be a function of its organizational systems and memories (Hedberg 1981). Individual members are subordinate to these systems and its corresponding processes (Moorman 1995) that represent "*collective ways of acting and thinking that have a reality outside individuals who conform to it*" (Durkheim 1938, cited in Moorman 1995:319). In this sense organizations will differ in their interpretations of the environment and their resulting ways of acting to influence organizational performance.

1.5 Synopsis

In this chapter the intellectual roots of the study pertaining to organizational learning were presented, the core theoretical constructs have been delineated, the research objectives were introduced, and the main assumptions underlying the framework have been established. In summary, learning is treated as a sequential process comprised of three sub-processes: scanning, interpretation, and action. Despite the considerable progress that has been made in understanding information processing in organizations, interpretation - the core construct of the learning process - remains largely under-utilised. In the following chapter a review of the literature on information interpretation is presented, the notion of interpretive diversity is explicated, and a model of interpretive diversity is introduced.

CHAPTER 2

INTERPRETATION, INTERPRETIVE DIVERSITY & LEARNING

CHAPTER 2

INTERPRETATION, INTERPRETIVE DIVERSITY, AND LEARNING

"All meanings, we know, depend on the key of interpretation"

- George Eliot
Daniel Deronda (1876)

A friend of mine is a medical student. One evening we were on the phone and he sounded very unhappy. He said that he had the most awful day at the hospital and that he risked failing the course he was attending. Apparently, the students were assigned in groups and each group had to diagnose and prescribe treatment for a patient. But much to their dismay, the members of his group couldn't agree on what was wrong with their patient. The first thing that came into my mind was that they probably didn't have enough information. But then he said that they had everything they could possibly ask for: clinical findings, test results, scan reports, the patient's history, everything; yet they still could not agree on what the patient had. Different people in the group would come up with different diagnoses, ranging from common infections to rare syndromes. I then asked what they decided to do. His answer was quite unexpected, although I now realize that it should have been foreseeable. He said that they decided to ask for another round of tests in case there was something wrong with the information they had at hand.

Similar stories can be found throughout the organization literature. As in the case of medical students, frequently in organizations: "*Information was gathered. More information was sought. Information was considered. But the link between decisions and information was weak. [...] It is possible, on considering these phenomena, to conclude that organizations are systematically stupid*" (Feldman and March 1981: 174).

I don't know what happened to the poor patient, but the story played on my mind. Essentially, this was about a group of people with equal access to the same information, creating divergent interpretations of a situation, which were in fact so different that they rejected the information, and were unable to take organized action at the time it was required. I thought that this was a very interesting phenomenon, and called it: "*interpretive diversity*", which represents the extent to which members of a group create diverse interpretations and is the central idea behind this thesis.

This chapter deals with interpretation of information, interpretive diversity, and their link with the learning process in organizations. Specifically, the construct of

interpretation is explicated and a review of the relevant literature is presented. Particular emphasis is paid on (1) circumscribing the nature of the information interpretation process, (2) presenting the influences and outcomes of interpretation that have been discussed in the literature, and (3) explaining its role in the organizational learning process. Next, the concept of interpretive diversity is introduced and its connection with organizational learning is discussed. Finally, a theoretical framework is proposed, linking interpretive diversity modes with the two other learning sub-processes, i.e., scanning and action. This chapter provides the theoretical basis upon which an integrated model of antecedents and consequences of the learning process is subsequently built.

2.1 Nature of Interpretation

Most of the descriptions that have been offered in the management literature represent interpretation as a process by which managers translate events and develop an understanding of their environment. Interpretation is generally seen as a process of meaning creation (Daft and Weick 1984; Huber 1991). However, a review of the studies on managerial interpretation reveals differences in the (1) theoretical domain, (2) organizational level, and (3) measurement focus and method of the underlying frameworks. These are discussed in turn below.

2.1.1 Domain

In terms of domain, interpretation has been linked with concepts such as sensemaking (Weick 1995; Thomas et al. 1993), organizational learning (Crossan et al. 1999; Fiol 1994; Huber 1991; Daft and Weick 1984), strategic issue diagnosis (SID) (Dutton, Fahey, and Narayanan 1983; Denison et al. 1996), strategic change or renewal (Rajagopalan and Spreitzer 1997; Lant, Milliken, and Batra 1992; Barr, Stimpert, and Huff 1992; Isabella 1990), and information processing (Corner et al. 1994; Moorman 1995).

2.1.2 Level: Individual vs. Organizational Interpretation

Studies of managerial interpretation also differ in their level of conceptualization and analysis. In theory, interpretation is seen to take place both at the individual and the

organizational level. Individual level interpretation has been described as a process in which people employ schemata to efficiently organize and encode incoming information (e.g. Harris 1994; Gioia and Manz 1985). A schema is a cognitive knowledge structure about specific concepts or theories derived from a person's experiences on how the world operates (Harris 1994). The individual interpretation process takes place through encoding, the transformation of incoming information into an abstract internal representation which is then infused with meaning (Corner et al. 1994). Meaning infusion is accomplished through a feature matching process, in which information is matched against a schema, and the ordering and interrelations among the existing schema elements are imposed on the incoming information (Corner et al. 1994; Harris 1994). As a result, an individual's existing schemata are in turn modified and expanded to incorporate the new information and then stored in memory to be retrieved again when a new stimulus is encountered. Bias can result from the matching process of meaning infusion, because pieces of existing knowledge that are stored in memory, and are biased towards the schema prototype, get included in the interpretation of new information (Corner et al. 1994). Hence, although schemata emerge to facilitate the interpretation process, they may also blind individuals to those features of information that threaten the validity of existing schemata or are outside their worldviews (Harris 1994; Kiesler and Sproul 1982). In this sense, schemata are thought to closely guide interpretation, directing information encoding and retrieval from memory, as well as subsequent behavior in response to that information (Harris 1994; Weick 1979). Examples of schemata in the literature include categories (Dutton and Jackson 1987), frames (Tversky and Kahneman 1981) and scripts (Gioia and Manz 1985).

Individual level interpretation precedes organizational level interpretation and provides a medium from which collective meanings are developed (Crossan et al. 1999). Organizational level interpretation is perceived as the interactive interpretation of information among decision-makers and is defined as "*the process of translating events and developing shared understanding and conceptual schemes among members of top management*" (Daft and Weick 1984:286). Interactive interpretation is thought to be necessary because the complexity of strategic decisions exceeds the cognitive limits of any individual member of a decision-making team (Schweiger, Sandberg, and Rechner 1989). During the organizational interpretation process, individual perceptions and understandings are shared among the members of the group and collective cognitive

maps are constructed. Similarly to the individual level, group level interpretation invokes frames or shared knowledge structures which function (1) as categories that group members use to collectively match information against previously held knowledge and (2) as mechanisms linking the individual members' interpretations into a collectively shared meaning and understanding of the information (Crossan et al. 1999; Corner et al. 1994). Organizational interpretation can reflect biases resulting from individual interpretations as well as biases from collective interpretations that originate in existing frames residing in the organization's memory[1].

2.1.3 Measurement Focus and Method

Operationalization and measurement of interpretation has proved a lot more difficult compared to conceptualization, but there has been some progress in this area, mainly in the strategic management literature, and for the most part confined to individual level interpretation. Apart from the interpretive studies of Fiol (1994) and Isabella (1990), there has been very little systematic study of how a shared understanding of information is developed among groups of organizational members.

In the marketing literature, with the exception of Prabhu and Stewart (forthcoming) and to a certain extent Moorman (1995), managerial information interpretation has been largely ignored. It is generally agreed that it is far more problematic to model, operationalize and measure the interpretation process, compared to the more "established" information acquisition and dissemination processes (Sinkula et al. 1997). There may be two reasons for this. First, the tacit nature of interpretation makes it difficult to observe and communicate (Sinkula et al. 1997; Nonaka 1991). Second, in marketing, interpretation has been almost mostly treated as a process. Yet according to Weick (1995), "... *interpretation can be a process but is just as likely to describe a product. It is common to hear that someone has made 'an interpretation'*" (p.13). Hence, although most conceptual models define interpretation as a *process* of meaning infusion or discovery, interpretation can just as well be an *outcome* or *product* in its own right.

Treating interpretation as a product, rather than a process, significantly simplifies issues of operationalization and measurement and effectively a number of empirical

[1] The concept of organizational memory is analytically discussed in chapter 3. Organizational memory concerns the collective beliefs, routines, and other physical artifacts that reflect the presence of stored knowledge (Moorman and Miner 1997, 1998).

studies in the management area have been realized (e.g. Denison et al. 1996; Thomas et al. 1993; Lant et al. 1992; Isabella 1990; Thomas and McDaniel 1990). An overview of the empirical research on interpretation is presented in Table 2.1 below. The studies measuring interpretation differ both in focus and the methodology employed. The measurement focus in these studies involves either the use of labels in the interpretation of issues, i.e., positive-negative, gain-loss, controllable-uncontrollable (Thomas and McDaniel 1990; Jackson and Dutton 1988), opportunity vs. threat (Denison et al. 1996), or interpretations of changes or events in the organization's environment (Isabella 1990). Finally, Thomas and McDaniel (1990) and Moorman (1995) have operationalized interpretation as the conceptual use of information.

TABLE 2.1: APPROACHES TO MEASUREMENT OF INFORMATION INTERPRETATION

Study	Domain	Level	Treatment of Interpretation	Measurement Focus	Method
Isabella 1990	Organizational Change	Group	Product	Interpretation of Events	Observation
Thomas, Clark, and Gioia 1993	Sensemaking	Individual	Product	Labels	Survey (Scenario approach)
Thomas, Shankster, and Mathieu 1994	Interpretation of Issues	Individual	Product	Strategic and political issues	Survey
Denisson, Dutton, Kahn, and Hart 1996	Strategic Issue Diagnosis	Individual	Product	Opportunity vs. Threat	Survey
Thomas and McDaniel 1990	Strategic Issue	Individual	Product	Labels; Extent of information use	Survey (Scenario approach)
Fiol 1994	Organizational Learning	Group	Product	Framing and Content of Communications	Observation
Moorman 1995	Organizational Market Information Processing	Group	Process	Conceptual Utilization of Information	Survey
Prabhu and Stuart (Forthcoming)	Competitive Signalling	Individual	Product	Focus and Strength of signals as bluffs	Experiment

2.2 Antecedents and Outcomes of Interpretation

2.2.1 Antecedents of Interpretation

A number of variables have been proposed to influence interpretation and these can be broadly classified to individual, group, organizational, and external influences.

➢ **Individual level antecedents**

At the individual level, personal attributes such as characteristics, attitudes, and abilities explain in part why different people interpret information about the environment in different ways. The theory underlying research in this area suggests that people form cognitive categories based on their personal experiences and observations of the features of a situation or event, which in turn influence the process of cognitive categorization (Thomas et al. 1994). A number of individual-level characteristics may affect the interpretations that develop from this categorization process. For example, cognitive elements such as, levels of existing knowledge, previous experience (Denisson et al. 1996; Thomas and McDaniel 1990), belief structures (Walsh 1988), language (Crossan et al. 1999), and predispositions towards information (Menon and Varadarajan 1992) are all considered as important influences on the content of interpretations. Moreover, functional background and experience in a given position have been found related to issue interpretation through affecting managers' cognitive frameworks (e.g. Bantel and Jackson 1989; Hambrick and Mason 1984).

➢ **Group level antecedents**

Group level factors have also been proposed to impact the interpretation process in organizations. Such influences include: TMT structure (Thomas and McDaniel 1990), scanning processes (Thomas et al. 1993) negotiated belief structures (Walsh and Fahey 1986), group communication behaviors (Fiol 1994; Donnellon et al. 1986), dominant logic (Bettis and Prahalad 1995), and interaction among group members (Crossan et al. 1999). In addition, a body of literature dealing with the effects of demographic characteristics and diversity of groups, suggests that aggregated demographic variables such as age, background, tenure, and personality of TMT members, also influence the interpretation of issues (e.g. Thomas et al. 1994; Bantel and Jackson 1989; Hurst et al. 1989).

➢ **Organizational level antecedents**

As Huber and Daft (1987) suggested, organizational context characteristics are also key determinants of how top managers interpret their environment. A review of the relevant literature reveals influences such as: organizational culture (Schein 1992; Moorman 1995; Sackmann 1992), cognitive consensuality among organizational members (Gioia

and Sims 1986), organizational beliefs (Franwick et al. 1994), strategy (Thomas and McDaniel 1990), communication flows (Menon and Varadarajan 1992), organizational inertia and level of resources (Denison et al. 1996), organizational memory (Moorman and Miner 1997; Sinkula 1994), organizational change (Rajagopalan and Spreitzer 1997; Isabella 1990), organizational intrusiveness and assumptions about the environment (Daft and Weick 1984). These organizational level parameters are thought to define what information is important and what is to be ignored during the interpretive processes, as well as the way that top managers perceive situations and interpret strategic issues (e.g. Weick 1979; Hedberg 1981; Thomas et al. 1994).

- **External influences**

The proposed factors external to an organization's environment that influence interpretation include: environmental change (Rajgopalan and Spreitzer 1997), environmental uncertainty (Milliken 1990), competitive signals and contextuals (Prabhu and Stewart forthcoming), relationship with information supplier (Moorman, Zaltman, and Desphandé 1992) and information cost (Menon and Varadarajan 1992).

2.2.2 Outcomes of Interpretation

Interpretation has been associated with a number of organizational outcomes, such as organizational change and renewal (Isabella 1990; Lant et al.1992), organizational learning (Fiol 1994), and creative action (Ford and Ogilvie 1996). Moreover, Thomas et al. (1993) have empirically established a positive effect of interpretation on performance and Moorman (1995) on new product outcomes. The basic premise underlying these studies is that the cognitive processes of constructing meaning provide the underlying logic for managerial actions, therefore influencing organizational outcomes (e.g. Walsh 1995). More specifically, the interpretations managers make about events, strategic issues, and environmental changes, are thought to impact the formulation of and selection among strategic alternatives and thereby, organizational renewal and performance (e.g. Barr et al. 1992).

A summary of studies addressing the antecedents and outcomes of interpretation are presented in Table 2.2 below.

TABLE 2.2: INFLUENCES ON THE PROCESS OF INFORMATION INTERPRETATION

Individual Manager Influences	Group Influences	Organizational Influences	External Influences	Outcomes
Levels of existing knowledge and experience. Denisson et al. (1996); Thomas & McDaniel (1990) *Belief structures* Walsh (1988) *Language* Crossan et al. (1999) *Predispositions towards information.* Menon & Varadarajan (1992)	*TMT structure* Thomas & McDaniel (1990) *Scanning processes* Thomas et al. (1993) *Negotiated belief structures* Walsh & Fahey (1986) *Communication behaviors* Fiol (1994); Donnellon et al. (1986) *Dominant logic* Bettis & Prahalad (1995) *Interaction among group members* Crossan et al. (1999)	*Culture* Schein (1992); Moorman (1995); Sackmann (1992) *Cognitive consensuality* Gioia & Sims (1986) *Strategy* Thomas & McDaniel (1990) *Communication flows* Menon & Varadarajan (1992) *Organizational inertia and level of resources* Denison et al. (1996) *Organizational memory* Sinkula (1994)	*Environmental change* Rajgopalan & Spreitzer (1997) Environmental uncertainty Milliken (1990) *Competitive signals and contextuals* Prabhu &Stewart (forthcoming) *Information cost* Menon & Varadarajan (1992)	*Organizational Change* Isabella (1990) *Performance* Thomas et al. (1993) *Learning* (Fiol 1994) *New Product Outcomes* (Moorman 1995)

2.3 The Role of Interpretation in the Learning Process

As part of the organizational learning process, interpreting is typically seen as a social activity, characterized by a thread of coherence among managers, who share their individual understandings in order to construct common meanings (Daft and Weick, 1984; Hedberg, 1981). Because the external environment is complex and dynamic, incoming information is often thought to be equivocal, i.e., it may hold multiple and often conflicting meanings (Crossan et al. 1999; Daft and Huber 1987). In effect, a main objective of the organizational interpretation process is equivocality reduction. Reaching a common understanding among organizational members is thought to reduce the equivocality of environmental cues and enable the organization to interpret as a system. In this sense, the interpretation system view is concerned with the mechanisms that

organizations must employ in order to interpret equivocal information and to create meaning for their members (Daft and Weick 1984). Such mechanisms include language/communication approaches and assembly rules.

The development and refinement of a common language is thought to play a pivotal role in enabling organizational members to create shared meaning and understanding. This is because language is important both in the development of the individuals' cognitive maps, as well as in the interaction between organizational members (Crossan et al. 1999). Because organizational level interpretation is a social activity, "*equivocality is reduced through shared observations and discussion until a common grammar and course of action can be agreed upon*" (Daft and Weick 1984: 291).

The nature and means of communication processes by which information is shared and interpreted are thought to be critical factors in facilitating organized action. In addition to language, a number of other communication mechanisms have been discussed in the literature. For instance, Donnellon et al. (1986) identify four communication mechanisms – metaphors, logical arguments, affect modulations, and linguistic indirections – that accommodate organizational interpretations. In the strategic management literature, group communication processes such as dialectical inquiry, devil's advocacy, and consensus are also considered important in ensuring that top managers will adequately explore and interpret the available information (e.g. Schweiger et al. 1986). Moreover, the framing of communications, i.e., the way people construct and express their arguments, is also a critical mechanism for creating shared meaning and accommodating learning in organizations (Fiol 1994).

Last, assembly rules refer to the mechanisms that organizations use to process data into a collective interpretation (Daft and Weick 1984). These mechanisms govern the information processing behavior among managers and are related to the level of perceived equivocality of the information entering the organization. Generally, high levels of equivocality in the available information are related with few rules and many information processing cycles among managers to arrive at a common interpretation (Daft and Weick 1984).

In conclusion, as part of the learning process, organizational interpretation relates to the processes that allow organizations as systems to make sense of equivocal information. Of major importance to management is ensuring that the right mechanisms

are in place for organizational members to interpret ambiguous events and provide meaning and direction for the organization as a whole (Daft and Weick 1984).

2.4 The Concept of Interpretive Diversity

Reaching a shared understanding is important because it provides common ground and direction for organizational members and gives each individual the ability to act in a way that is consistent with the actions of others and with the spirit of the decisions (Amason 1996).

As noted above, for coherence to evolve, mutual adjustment and negotiated action by decision-makers is required (Crossan et al.1999). The distinctive feature of collective interpretation is sharing (Daft and Weick 1984). This involves an interactive process of selecting, comparing, and evaluating the individual interpretations of members, which takes place through conversation and dialogue and often leads to the discovery of new meanings. Eventually, a suitable integrative meaning is established, which becomes entrenched in the organization's memory and serves as a larger knowledge structure for interpreting future issues. However, reaching a collective interpretation does not necessarily imply that decision-makers share all meanings – quite the opposite: because strategic decision making involves a number of managers, often from different functional backgrounds, diversity in the meanings they create is very likely to occur. Rather, it suggests that they are able to agree on one or more meanings and come to some shared understanding of the information, so that co-ordinated action may be taken (Corner et al.1994).

Of real interest to managers is how to ensure that their collective interpretations will lead to effective organizational actions. In other words, the question of interest is how to turn an organization into a skilled interpreter of environmental events. Here, it is proposed that responding to environmental challenges with creative solutions depends on the level of interpretive diversity that an organization is able to generate. In the following sections, the rationale for introducing the notion of diversity in the interpretation process is contended and grounded on an apparent organizational learning paradox. Moreover, the construct of interpretive diversity is formally defined and a theoretical framework for interpretive diversity modes is presented.

2.4.1 Diversity, Consensus, and the Organizational Learning Paradox

➢ **The Learning Paradox**

Diversity in interpretations may develop in organizations for two main reasons: First, because decision-makers differ in the personal factors, such as individual experiences, beliefs, cognitive capabilities, and personal agendas, which drive the mental models employed to interpret information. For instance, Desphandé and Zaltman (1982) have shown how managers are likely to discount or downplay new information that is not consistent with their prior beliefs. Second, diversity may develop because information about the environment is often highly equivocal and as such, subject to multiple and often conflicting interpretations.

If the nature and diversity of interpretations influence organized action and learning, then the next issue concerns the nature of this effect. The literature points to the existence of a paradox: One the one hand, consensus among organizational members characterizes the act of organizing and enables the organization to interpret and learn as a system (Daft and Weick 1984). On the other, learning and the development of new knowledge require varied interpretations so that the range of potential organizational actions can change in response to emergent environmental conditions (Huber 1991).

A similar contradiction exists in the strategic management literature focusing on whether diversity (cognitive or demographic) among executives results to positive organizational outcomes or not. Some researchers have argued that higher levels of diversity lead to executive creativity, efficient decision-making, and positive outcomes (e.g. Dooley and Fryxell 1999; Bantel and Jackson 1989), because they reduce the likelihood of a groupthink-type phenomenon, reduce costs for additional analyses and external consultants, and negatively affect cohesion, which is thought to have a negative impact on decision-making effectiveness. Others, (e.g. Miller et al. 1998; Daft and Lengel 1986) suggest that executive diversity results in less communication, less effective decisions, and poor organizational outcomes, because it leads to communication failures and implies disagreement over strongly held preferences and beliefs that are not easily compromised.

In the case of interpretation, the "contradiction" between consensus and diversity seems to be an inherent element of the organizational learning process. As Fiol (1994) suggests, "*the apparent paradox is that collective learning, by definition, encompasses*

both divergence and convergence of the meanings that people assign to their surroundings" (p.404). This is because organizational learning inherently involves the ability to share a common understanding of diverse interpretations, in order to better exploit the generated information.

➢ **The Resolution**

Fiol (1994) proposes that a way to deal with this paradox is to conceptualize meaning as a multi-dimensional construct. She proposes two dimensions around which consensus or diversity can develop: the *content* of communications and the *framing* of communications. The content of communications refers to interpretations that reflect what is being expressed in a communication; specifically, to whether statements denote personal judgment or objective pictures. The framing of communications refers to the way people construct their arguments regardless of the content; in other words, to how rigidly and broadly people express their opinions. Fiol (1994) takes the view that organized action takes place despite diversity among organizational members, because it "*can occur in the face of dissension around one dimension of meaning, as long as there is consensus around another*" (p.405). Hence, although people may disagree about the content of communications, learning can still occur, if they converge around an argumentative frame that is broad and flexible enough to encompass all the different interpretations. This state is referred to as *unified diversity* and is associated with higher levels of learning and corporate innovation, because it allows for multiple pictures of what is thought to be true to become embraced within a unifying frame.

Fiol's (1994) study offers an important framework for studying group processes of interpretation, because it accounts for the possibility of both unity and diversity of interpretation unfolding simultaneously during decision-making. More importantly, it shows how diversity of interpretation can enhance the learning process, as long as managers express arguments in a manner that accommodates multiple perspectives.

➢ **The Extension**

Yet although Fiol's (1994) study is about "*a cognitive framework for studying the collective processes of negotiating toward shared understanding of new and diverse information*"(p.417), it focuses primarily on the nature of arguments raised during decision-making and the way that these communications are expressed. Information

processing variables are not directly addressed in either the conceptual or the empirical work. Fiol's study is more about the *negotiating* processes for shared meaning creation rather than the *cognitive* processes of information interpretation. Although interpretations reflected in the content and framing of communications play an undeniably important role in the collective sense making process, looking at interpretation in terms of market information variables provides a more direct assessment of the cognitive methods by which new information is ordered and arranged for meaning creation. For this purpose, an alternative typology of interpretive diversity is developed in this thesis, that implicates market information variables directly in the content and framing dimensions.

2.4.2 Definition of Interpretive Diversity

Interpretation of information is defined as a process of meaning creation, where meaning resides in the content and framing of market information. Unlike Fiol's (1994) study, the variable of interest here is the content and framing of market information *per se* rather than the content and framing of communications.

Content of interpretation refers to a cognitive representation that reflects *what is* conveyed in the market information. In other words, it is about management's inferences of what the acquired information means and what its implications for decision-making are. As noted above, managers will construct meaning by employing cognitive categories that are associated with personal and organizational belief structures (Fiol 1994; Walsh et al. 1988). These categories will paint a cognitive picture that serves to organize the various bits of information in a meaningful way (Fiol 1994).

In addition to information content, meaning also resides in the framing of market information. The management literature has a long tradition of suggesting that managers use frames of reference for ordering and filtering market information to make sense out of the mass data they receive (e.g. Shrivastava 1987; Shrivastava and Mitroff 1984; Weiss and Bucuvalas 1980; Shrivastava and Schneider 1984; Thomas and Tymon 1982). These frames serve to define the boundaries of a domain of inquiry, suggest appropriate methods for data collection, and allocate significance, value, and priority to incoming information (Choo 1998). In this sense, meaning residing in the framing of market information will be reflected in the criteria used for classifying, evaluating, and judging the relevance of information to a problem or decision. A number of interpretive criteria

for evaluating market information have been proposed over the years, focusing mainly on the concepts of information quality (Weiss and Bucuvalas 1980; Maltz and Kohli 1996; O'Reilly 1982), actionability, novelty (Desphandé and Zaltman 1982; Weiss and Bucuvalas 1980), credibility (John and Martin 1984), and relevance (Thomas and Tymon 1982; Shrivastava 1987). Menon and Varadarajan (1992) provide a refined conceptualization of these criteria, suggesting that they all fall under two related but independent constructs: the credibility and usefulness of information. Credibility refers to the quality dimensions of information, which involve: realism, accuracy, specificity, consistency, completeness, and validity of information (cf. John and Martin 1984). Usefulness of information refers to the capability of the information to provide direction for decision-makers. The underlying dimensions include: meaningfulness, goal relevance, actionability, and innovativeness of information (cf. Thomas and Tymon 1982). These cognitive frames of reference are essential in the process of meaning creation, because they serve to reduce ambiguity and provide clarity, priority, and order, by pointing which information is important and credible for organizational action. Furthermore, the way market information is interpreted along these frames will also impact the extent to which information will be subsequently utilized in the decision-making process (Menon and Varadarajan 1992). Hence, any market information that is interpreted as irrelevant or inaccurate may be excluded from the decision-making process.

In summary, interpretive diversity concerns the extent to which members of a decision-making team form different interpretations around the content and/or the framing of market information. Interpretive diversity of content refers to the degree to which decision-makers have a different understanding of the meaning that the collected market information conveys, while interpretive diversity of frame refers to the degree to which they construct different evaluations of the credibility and usefulness of market information.

Consider the following example: A group of managers in a new vehicle development team gather market information to make decisions concerning the car's specifications. One piece of information indicates that 70% of consumers value safety above all. Some members of the team may interpret this information as implying that crash safety features such as side airbags, three point safety belts, etc. should be included in the car. However, others may interpret this information as suggesting that, where

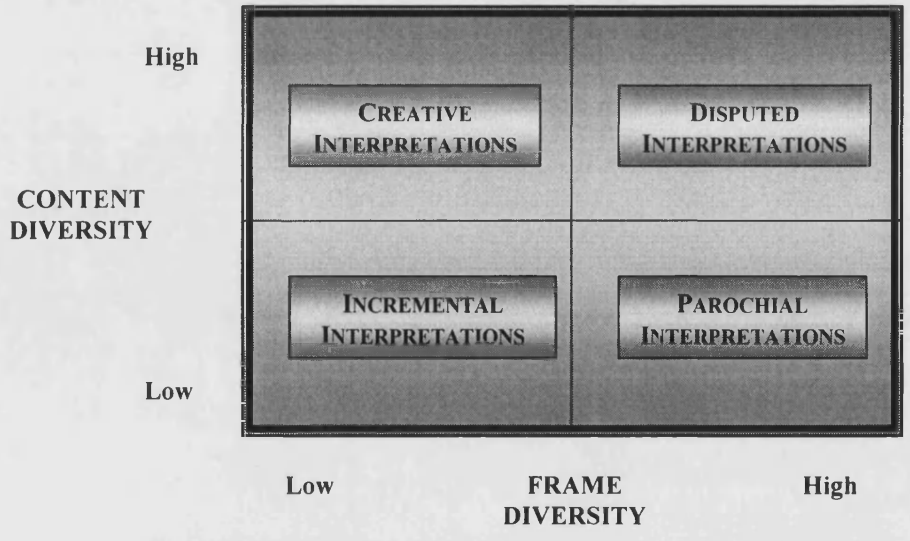
safety is concerned, attention should be primarily paid to the dynamic driving safety features such as antilock breaks, progressive handling, etc. (content diversity). In addition to divergence on what the information implies for the specifications of the car, disagreement may also develop around the framing of the information. For instance, some of the team members may discount this piece of information as unrealistic or inapplicable in the specific decision context (frame diversity).

Obviously, interpretive diversity of the content and frame may occur simultaneously or independently from one another. Just because team members disagree on the content of their interpretations does not mean that they will also disagree on the way they frame the information. As Fiol points out: "*Achieving agreement about the frame or content does not automatically imply agreement about the other*" (1994:405).

2.4.3 Developing a Framework for Interpretive Diversity

Based on the idea that organizational learning encompasses the possibility for both consensus and diversity to occur simultaneously, collective interpretations may be categorized according to the level of interpretive diversity of content and frame during the shared meaning creation process. The interplay between the two interpretive diversity dimensions results in four types of collective interpretations, presented in Figure 2.1. Each quadrant is discussed in turn below.

FIGURE 2.1: MODES OF INTERPRETIVE DIVERSITY



Creative interpretations are likely to emerge from high interpretive content diversity and low interpretive frame diversity. This is an instance of increased realized coverage of the possible meanings and implications of market information, with simultaneous agreement on its cognitive evaluation. Decision-makers interpret information from many different perspectives and construct multiple opinions about the implications it conveys, while at the same time concur in the way they frame it against the criteria of credibility and relevance for organizational action. Creative interpretations are analogous to achieving *unified diversity* among team members, i.e., of "*embracing diverse pictures of what is thought to be true within a unifying frame*" (Fiol 1994: 406). Consider the new vehicle development example discussed above: The fact that managers construct interpretations of "safety" both in terms of additional features and in terms of car handling, suggests that they will be able to include both interpretations in the design process, provided of course that they can agree that the information they base their decision on is credible and relevant for the task. The achievement of unified diversity over time, suggests an ability to constantly renew decision-makers' mental models, because multiple interpretations are constantly brought in the decision-making process, which enable the organization to stay alert to environmental changes and respond with creative solutions (Barr et al. 1992).

Disputed interpretations are likely to emerge from high interpretive diversity of content and frame. This means that decision-makers will differ both in their understanding of the meaning that market information conveys as well as on the way they order and assess the information cues. In other words, each member will construct different meanings and will perceive different parts of the information as accurate and relevant for decision-making. Such levels of diversity imply disagreement over strongly held beliefs that will not be easily compromised (Miller et al. 1998) and may lead to dysfunctional conflict, focused on personal incompatibilities and disputes (Amason 1996). Unless organizational members manage to resolve the tension between individual beliefs and the need to include many points of view in the interpretation process, it will be very difficult to reach an agreed meaning of the market information. The persistence of disputed interpretations suggests that information is not likely to be utilized in decision-making.

Incremental interpretations are likely to emerge when there is low interpretive diversity along both content and frame dimensions. Low interpretive diversity implies a

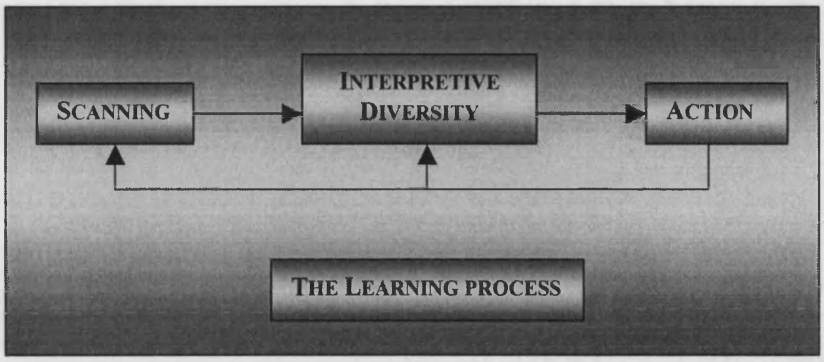
convergence of preferences and beliefs among organizational members and a presence of deeply entrenched collective knowledge structures, similar to the concept of dominant logic proposed by Prahalad and Bettis (1986). A high degree of uniformity in the meaning creation process suggests that only incremental collective interpretations are possible because interpretations that are presented early in the process are likely to go unchallenged and uninvestigated by organizational members (Miller et al. 1998). A constant low interpretive diversity of the meanings that decision-makers are able to construct can lead to less accurate mental models, analogous to a groupthink phenomenon (Janis 1972).

Parochial interpretations are the outcome of high frame and low content diversity. This is a case of "collective myopia" (Day 1994), which is prevalent when organizational members come from different "thought worlds" and as a result order and evaluate information using different criteria, even though their interpretations of what the information conveys may be similar. Parochial interpretations are in a sense the result of seeing the same picture using different lenses, i.e., of arriving at the same solution through different cognitive routes. High frame diversity often implies that different members will use their own specialized languages and stories to communicate with each other and impose their own different structure and order on the information – although in terms of implications the content of their interpretations may converge. Over time, consistent divergent framing of information may compromise the clarity of interpretations because it can lead to communication failures (Miller et al. 1998) and the accuracy of mental models because it can lead to constrained/directed attention.

2.5 Interpretive Diversity & the Learning Sub-Processes

Given that interpretation is a key construct of organizational learning, the model of interpretive diversity presented above can be completed by making predictions concerning the key sub-processes associated with the learning process, i.e., scanning and action. The framework adapted from Daft and Weick (1984) presented in the previous chapter can be modified to incorporate interpretive diversity as shown in Figure 2.2 below.

FIGURE 2.2: THE THREE LEARNING SUB-PROCESSES



Based on this, the elements of scanning and action, and their relationship with interpretive diversity, are in turn now specified. The section culminates in a comprehensive model of interpretive diversity.

2.5.1 Scanning

In order to ensure a fit between the organization and the environment, firms need to continuously scan their markets for information about changes and opportunities. The process of scanning, which has also been termed as knowledge acquisition (Huber 1991), information search (Weiss and Heide 1993), and intelligence generation (Kohli and Jaworski 1990), refers to the process of bringing information about the external environment into the boundary of the organization. Scanning involves searching both the external environment for important events or issues that might affect an organization (Daft and Weick 1984) and the internal environment for important elements that might bear on future performance (Thomas et al. 1993). Hence, information may be acquired from a variety of internal and external sources and in a variety of modes i.e., formal/informal, written/oral, surveillance/motivated. Scanning occurs both at the individual and at the group level and is limited by attention at both levels. At the individual level, the limited or selective attention capacity of the individual, "filters" information in a way that reduces the amount of information available for further processing and decision-making (Corner et al. 1994; Kiesler and Sproul 1982). Similarly, at the collective level, a group has limited capacity for attention, caused by organizational processes or routines for gathering and sharing information (Levitt and March 1988). Over time, shared meanings among members of the organization provide for a consensus view that links the individual and organizational level attention

processes, resulting to commonly shared "definitions" that determine what information is appropriate for the members' attention and is made available for interpretation (Corner et al. 1994).

Generally, the more information enters an organization the greater the propensity for interpretive diversity to develop among organizational members. Creative and disputed interpretations will be the result of intensive information acquisition processes. Hence, for organizations wanting to encourage multiple perspectives and rich interpretations of content, data about the environment must be acquired regularly, extensively, and from a variety of internal and external sources. However, excessive amounts of data may create information overload, because in these instances the information processing requirements exceed the interpretive capacity of organizational members. Information overload and excessive source variety are likely to trigger high frame diversity, because the range of different evaluative structures imposed on the information becomes, automatically, significantly wider. Therefore, in instances of information overload, disputed interpretations are likely to occur.

On the other hand, moderate information acquisition processes will be associated with low interpretive content diversity. Organizations that construct incremental interpretations are likely to devote few resources to scanning the external environment and will be selective about what information they pay attention to. Incremental interpretations are associated with routine information from few sources. Because there will be little and indisputable information available for interpretation, interpretive diversity of content and frame is likely to be low. Parochial interpretations will also be associated with moderate information acquisition processes. In these organizations scanning will be selective, ad hoc and irregular. Information for parochial interpretations will come from a variety of different personal sources and as a result the information is likely to invoke high frame diversity, because different sources will be regarded as more credible or appropriate by different decision-makers.

3.5.2 Action

Action is typically conceptualised as an outcome measure of learning, resulting from the environmental scanning activities and the subsequent interpretations of information (e.g. Daft and Weick 1984). Organizational actions are considered both the ultimate manifestation of learning and a means to facilitate new learning, because feedback from

actions may provide new cues for organizational members to interpret (Sinkula et al. 1997). Because strategic decisions are collective occurrences in most organizations, that are not so much "made" as they are developed in a context of meaning, learning may be thought of as the organizational enactment of strategic decisions. (Corner et al. 1994; Daft and Weick 1984). Effective action is seen to depend on the ability of the organization to develop and implement decisions based on rigorous information acquisition processes and skilled interpretations of collected information (Thomas et al. 1993).

Theorists have represented organizational actions in a number of ways. For instance, in the marketing literature the responsiveness dimension of market orientation (Kohli and Jaworski 1990) and the marketing program dynamism construct (Sinkula et al. 1997) are posited to reflect market-based organizational actions. In the management literature, organizational actions have been associated with constructs of organizational change (e.g.Thomas et al. 1993; Rajagopalan and Spreitzer 1997) and strategic renewal (Hurst et al. 1989). What appears to be common in all conceptualisations is that adaptive organizational actions involve some form of change; ranging from small scale alterations in products/services or changes in procedures, to large-scale alterations such as organizational restructuring and new product introductions (Thomas et al. 1993).

Here, action is represented by the concept of adaptation. Adaptation has been defined as "*the deliberate change in organizational actions by decision makers in response to changed organization-environment conditions*" (Duncan and Weiss 1979: 81). Compared to the constructs discussed above, adaptation has the advantage of capturing at the same time both change in action and level of utilization of information about the environment.

Based on this, decisions are seen as commitments to organizational action that are predicated on managerial interpretations of environmental cues and beliefs about cause and effect relationships (e.g. Daft and Weick 1984). This essentially comprises a cognitive perspective on adaptation. Because adaptation is about deliberate purposeful change in organizational actions, a basic condition is that, for such changes to occur, a certain level of cognitive change in the top managers' mental models is first required (Barr et al. 1992). In other words, managerial cognitions are seen to be closely linked to managerial actions (strategic decisions), and change in managerial actions can be

inferred from the extent to which cognitions alter in response to incoming information about the organization's environment.

Because decisions/actions are depicted as outcomes of information processing (Crossan et al. 1994), it is proposed that different interpretation modes will be associated with different levels of cognitive adaptation during the decision-making process. Generally, frame diversity will be associated with the information utilization component of adaptation. This is because, for information to be utilized in the collective decision-making processes, a minimum agreement is required among group members, that the information will be credible and useful to the task at hand. At the same time, content diversity will be associated with the cognitive change component of adaptation. High content diversity means that multiple perspectives will be allowed in the decision-making process, stimulating new ways of thinking about the decision.

In this sense, creative interpretations are likely to be associated with high levels of adaptation. In the instance of unified diversity, use of information is ensured by consensus around the framing of information while change in cognition by the diverse interpretations of the content of information brought in by decision makers. On the other hand, parochial interpretations will be associated with low adaptation, because decision-makers neither bring multiple pictures in the process, which would encourage fresh thinking, nor agree on the way they frame the information, which would allow a unifying framework for the use of information during decision-making. Disputed interpretations, resulting from high interpretive content and framing diversity of information, indicate an instance of the medical example mentioned in the introduction of the chapter. Group members are unable to reach consensus on what the information suggests or on the framing of the information at hand. As a result are unable to use the information to make a decision. Finally, in the case of incremental interpretations, the low levels frame diversity may ensure that a unifying frame is present to ensure commitment to the information, but the lack of debate and mental investigation associated with low content diversity suggests that information use will be controlled and the cognitive adaptation required will be limited.

The elements of scanning and adaptation can now be incorporated into a comprehensive model of interpretive diversity. This is specified in Figure 2.3 below.

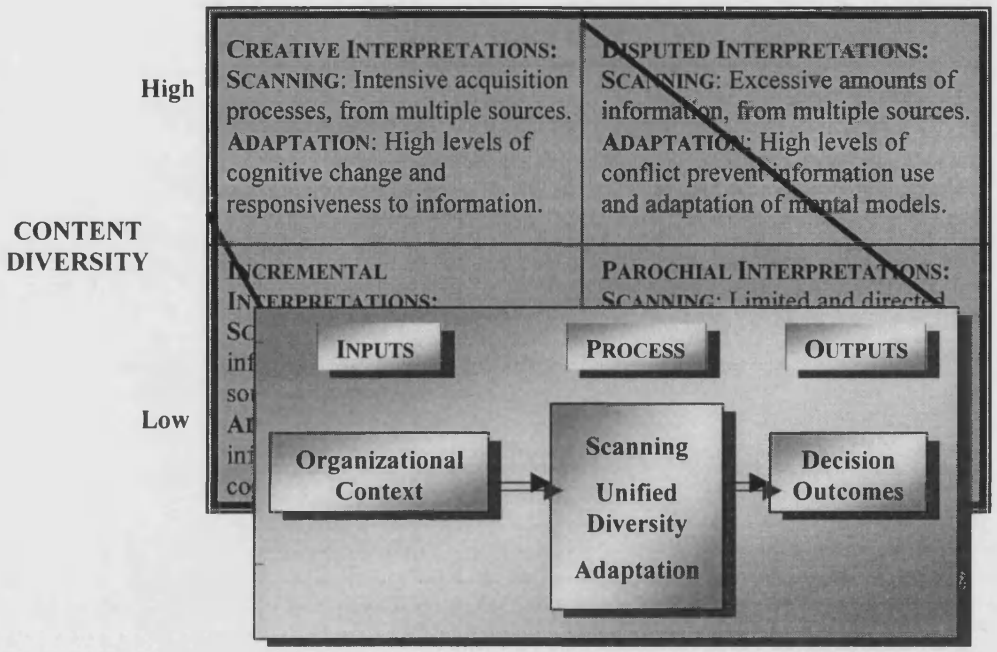
FIGURE 2.3: INTERPRETIVE DIVERSITY: LINKAGES WITH LEARNING SUB-PROCESSES

CONTENT DIVERSITY	FRAME DIVERSITY: Low	FRAME DIVERSITY: High
High	**CREATIVE INTERPRETATIONS:** **SCANNING:** Intensive acquisition processes, from multiple sources. **ADAPTATION:** High levels of cognitive change and responsiveness to information.	**DISPUTED INTERPRETATIONS:** **SCANNING:** Excessive amounts of information, from multiple sources. **ADAPTATION:** High levels of conflict prevent information use and adaptation of mental models.
Low	**INCREMENTAL INTERPRETATIONS:** **SCANNING:** Selective and routine information acquisition from few sources. **ADAPTATION:** Moderate levels of information utilization and minor cognitive change and adaptation.	**PAROCHIAL INTERPRETATIONS:** **SCANNING:** Limited and directed information search from personal sources. **ADAPTATION:** Controlled information use. Cognition biased towards personal preferences. Low adaptation.

2.6 Towards a Model of Unified Diversity

The conceptualization of the four different modes of interpretive diversity presented above and the links with the two other learning sub-process of learning, (i.e., scanning and adaptation), provide a useful starting point for empirically addressing the concept of interpretation in organizations, as well as the possible antecedents and outcomes of the learning process. Given, however, that there are four possible modes of interpretive diversity, associated with different interpretation modes, scanning, and adaptation processes, exploring the organizational context antecedents and decision-making consequences for each mode would be a immense task, far beyond the scope of this thesis. It was therefore decided to develop and empirically test a model of the learning process associated with one interpretation mode, namely creative interpretations. The decision to focus on the particular mode is justified on the need to provide confirmatory support for Fiol's (1994) initial proposition, that a state of unified diversity, i.e., high content/low frame diversity, is positively associated with enhanced organizational learning and therefore, improved performance. The objective therefore, is to build and test an integrative framework linking organizational context, learning, and decision outcomes. This is graphically portrayed in Figure 2.3 below.

FIGURE 2.3: DEVELOPING A MODEL OF THE LEARNING SUB-PROCESSES



2.7 Synopsis

Interpretation is an important process for organizations because through it, information is classified, sorted, and simplified in coherent patterns (e.g. Day 1994). In this sense, interpretation helps organizations in several ways. By imposing order on ambiguous information it reduces uncertainty about the environment. Moreover, it provides the underlying rationale from which strategic action can be initiated and thereby has important performance implications. A critical issue for research and practice is how to turn an organization to an efficient interpreter of environmental developments. Here it is proposed that responding to market challenges with creative marketing solutions depends on the level of interpretive diversity generated among decision-makers. Specifically, by building on the content and frame distinction proposed by Fiol (1994) a framework of interpretive diversity is developed, linking interpretive diversity to the two learning sub-processes of scanning and adaptation, and proposing that creative interpretations will be the outcome of unified diversity, that is, of high content - low frame interpretive diversity. This idea is further advanced towards the development of an integrated model of antecedents and consequences of the learning process, which is fully realized in the following chapter.

CHAPTER 3

A MODEL OF THE ORGANIZATIONAL LEARNING PROCESS: CONTEXT ANTECEDENTS AND DECISION CONSEQUENCES

CHAPTER 3

A MODEL OF THE ORGANIZATIONAL LEARNING PROCESS: ORGANIZATIONAL CONTEXT ANTECEDENTS AND DECISION OUTCOMES

> *"The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man."*
>
> George Bernard Shaw
> Man and Superman (1903)

The central point underlying the theory presented in the previous chapter is that a fundamental issue for managers and academics is how organizations can become skilled interpreters of environmental events. Although a framework of interpretive diversity is a potentially useful way of addressing this issue, we still know little about the types of organizations that are capable of generating creative interpretations and superior learning. In this sense, what appears to be missing is a more general model for studying interpretation and learning within a nomological set of antecedents and consequences. Against this backdrop, a key contribution of this thesis is that it develops and tests a model of the organizational level inputs and marketing decision outputs of the learning process within the framework of unified diversity. Specifically, this chapter is concerned with developing and presenting the model and the relevant hypotheses. First, an overview of the overall model is presented and the rationale underlying the choice of variables is discussed. Then, the relationships between the model variables are delineated and the corresponding hypotheses are presented. Such a model provides an a priori basis for focusing efforts on specific contexts that can enhance learning, interpretation, and decision effectiveness and enables the post hoc analysis of prior marketing decisions.

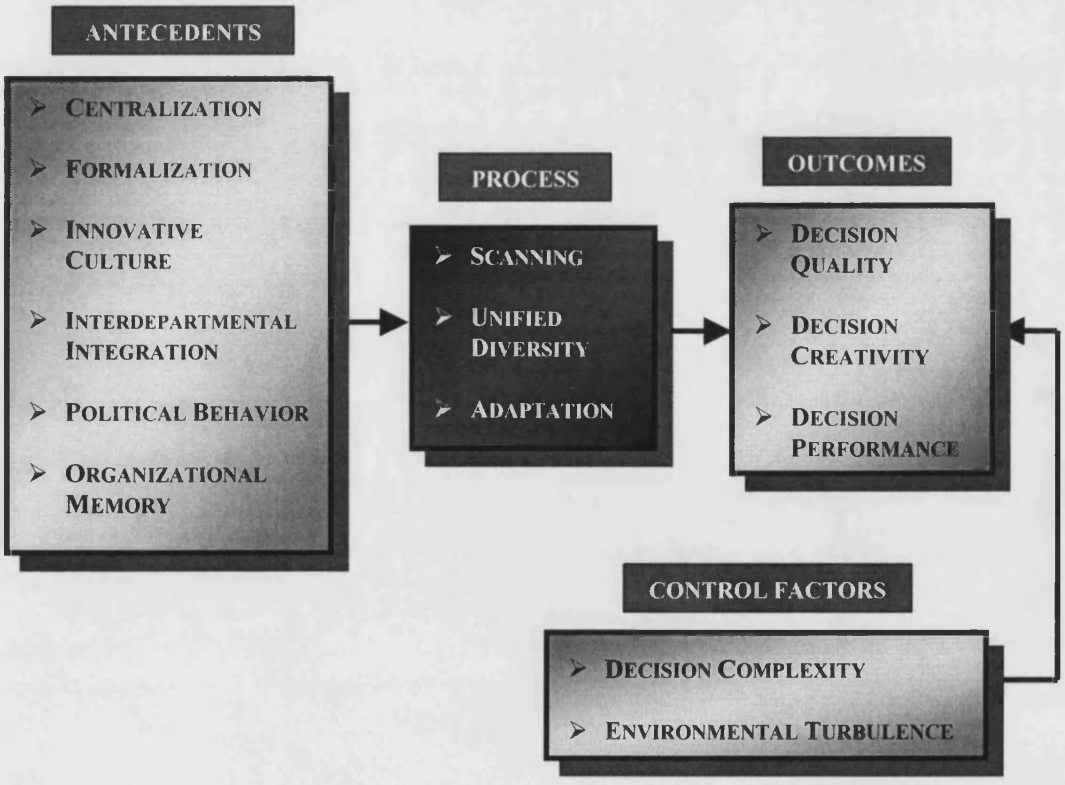
3.1 A Model of the Antecedents and Consequences of the Learning Process

Although there already exists a body of empirical research focusing on the influences of interpretation (e.g. Denison et al. 1996; Thomas and McDaniel 1990) as well as the consequences of learning (e.g. Thomas et al. 1993; Sinkula et al 1997), no study has conceptually or empirically addressed both the antecedents and outcomes of the organizational learning process. Thus, a systematic, integrated model linking organizational context, the learning process, and decision outcomes is needed. The

objective here is neither to propose a model that delineates all possible relationships underlying learning and interpretation, nor to propose an exhaustive list of organizational context factors and performance outcomes associated with the learning process. Rather, by drawing on the literature on knowledge utilization, organizational information processing and strategic decision-making, a parsimonious model that integrates the *key* organizational context variables and the major decision-related outcomes, is presented and subsequently tested.

As noted in the previous chapter, the learning process is now conceptualized as encompassing the three sub-processes of scanning, interpretive diversity, and adaptation. Particularly, with reference to interpretive diversity the objective is to test the framework of *unified diversity*, i.e., the extent to which managers generate multiple pictures of the information (high content diversity), within a unifying frame (low frame diversity). The overall model of antecedents and consequences of the learning process is presented in Figure 3.1 below.

FIGURE 3.1: A MODEL OF THE LEARNING PROCESS ANTECEDENTS AND OUTCOMES



➢ **Choice of Antecedents**

Potentially a great number of factors could impact learning in organizations. However, in this model only the major variables associated with organizational context are highlighted – that is, those variables that are theoretically likely to explain a significant proportion of the variance in the three learning sub-processes. The antecedent variables involved in the model are: organizational structure (centralization and formalization), culture, integration processes, political behavior, and organizational memory. The rationale for choosing the particular variables for representing organizational context is based on the literature on knowledge utilization and information processing. For instance, according to the structure-contingent model of knowledge use, variations in the structure of organizations are seen to determine the scope and variation in knowledge utilization and learning (Dunn 1980). Organizational culture has been associated with the process of marketing strategy making (e.g. Menon et al. 1999, Desphandé and Webster 1989), as well as with organizational learning and sense making (e.g. Sinkula et al. 1997; Harris 1994). The process-contingent model of knowledge utilization holds that variations in knowledge use are also determined by the nature and types of interaction among policy members in various stages of the decision-making process (Rich 1979; Dunn 1980). Moreover, in this view, knowledge generation, transfer, processing, and use are seen as political processes, suggesting that the level of politics present should also have a potent effect on the learning processes. Last, the construct of organizational memory has been closely linked to the learning process, given that what an organization already knows affects how it scans its environment, how it interprets incoming information, and how it comes to take organized action (e.g. Sinkula 1994). Each of the context variables is formally defined and its relationship with the three learning sub-processes is explicated in section 3.2 of this chapter.

➢ **Choice of Consequences**

As far as learning outcomes are concerned, although a body of work exists exploring the linkages between organizational learning and performance, with the exception of Thomas et al. (1993) who focus on the effect of sensemaking on organizational performance, very little has been done in determining the impact that all three learning sub-processes have on outcomes. Particularly in marketing, apart from Sinkula et al. (1997) who focused on the impact of information acquisition and dissemination on

marketing program dynamism, the market orientation – performance literature (e.g. Jaworski and Kohli 1993), and Moorman's (1995) study on the impact of organizational market information processes on new product outcomes, no other work has provided any evidence as to the effects of learning-related processes to marketing outcomes. Yet, the inherent link between the action component of learning and decision-making suggests that examining how differences in marketing decision outcomes are related to differences in the ability of decision-makers to carry out the three learning tasks of scanning, interpreting and acting, is of major importance for marketing practitioners and academics. It is clear that without a decision performance referent, marketing managers cannot have a good way of evaluating the effectiveness of their scanning and interpretation processes or the associated actions during marketing decision-making (e.g. Thomas et al. 1993). Moreover, examining the decision effectiveness implications of the learning sub-processes can provide a basis for understanding how the market information processing structures of organizations might be designed to facilitate these important activities.

Determining however decision effectiveness calls for an assessment of its consequences, which poses a number of difficulties. As Nutt (1998) notes, decision makers often act without recognizing the outcome of their actions. Even when outcomes are observed, determining their consequences is difficult because it is often hard to separate the good from the bad outcome (Nutt 1998). Curren, Folkes, and Steckel (1992) also note that marketing managers tend to give flattering explanations for their own decisions. In addition, outcomes that serve a manager's personal interests may be perceived as good while those that do not, as neutral or poor. Last, the downstream impact of a decision may be lost (Nutt (1998). This means that decisions that seemed good at the time they were made may prove to have less of an impact, because of unanticipated occurrences. Hence, given the problems associated with determining decision effectiveness and the lack of prior work in this area, Nutt's (1998) recommendation is followed: "*The consequences of a decision are apt to have many effects that make a single measure unwise*" (p.200). Based on this, three decision-related outcomes are investigated: decision quality, decision creativity and decision performance. Decision quality concerns the intrinsic value of the decision to the organization (e.g. Nutt 1998; Dooley and Fryxell 1999); decision creativity is defined as the extent to which the decision is novel for the organization and its implementation

changes marketing thinking and practice (e.g. Andrews and Smith 1996; Moorman 1995; Wilton and Meyers 1986); and decision performance concerns an overall indication of decision effectiveness with reference to the more "objective" managerial expectations of decision success, that is, the overall performance, sales and profits, compared to expectations (e.g. Menon et al. 1999).

The specific decision effectiveness indicators were chosen for two reasons. First, they appear to be conceptually independent. For instance, decisions that are perceived of high quality do not necessarily have to be creative, that is, depart from established organizational practices and/or set new trends for the industry. Similarly, decisions that are considered as breakthroughs at the time they were made may have little impact on organizational performance over time. Because the three constructs do not seem to conceptually overlap, some of the measurement problems noted above can be surmounted and several facets of a "successful" decision can be captured (e.g. Nutt 1998). Second, these three success variables where chosen because they have all been conceptually linked with the learning sub-processes. The construct of decision quality has been often associated with the cognitive capabilities of the top management team as well as the processes through which the team makes decisions (e.g. Amason 1996; Dooley and Fryxell 1999). Creativity and innovation are seen as important outcomes of organizational learning (e.g. Ford and Ogilvie 1996; Hurley and Hult 1998), suggesting that decision creativity should be a central objective of the three learning sub-processes. Last, organizational learning and the learning sub-processes have been conceptually and empirically associated with superior performance (e.g. Thomas et al. 1993; Sinkula et al. 1997; Slater and Narver 1995).

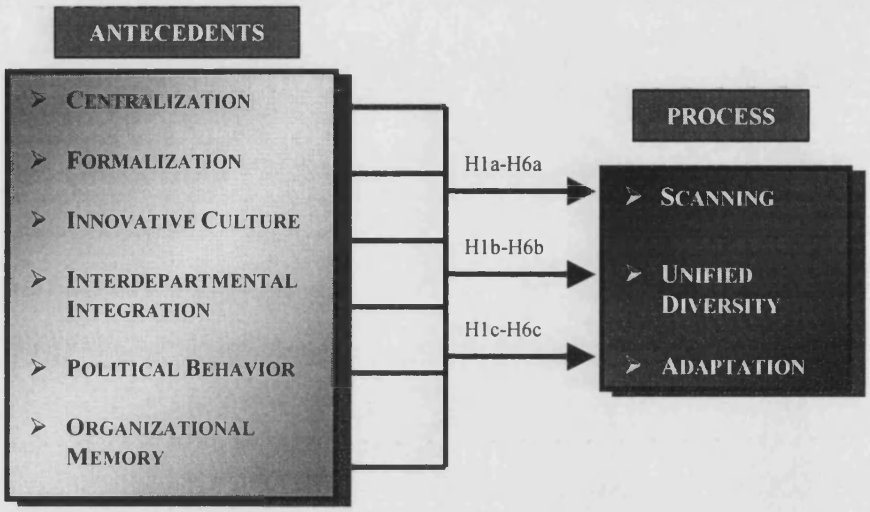
The anticipated relationships and proposed hypotheses pertaining to the model variables are discussed in the following sections.

3.2 Organizational Context Antecedents to the Learning Process

In this section the relationship between organizational context and the learning process is delineated with a view to proposing hypotheses relating to the following question: What kind of organizational context is likely to be associated with superior organizational learning processes, i.e., scanning, unified diversity and adaptation? In total six variables make up the organizational context antecedents, i.e., centralization of structure, formalization of structure, innovative culture, interdepartmental integration,

political behavior, and organizational memory. The anticipated linkages with the learning sub-processes are graphically presented in Figure 3.2 below, while each variable is discussed in turn in the following sections.

FIGURE 3.2: ORGANIZATIONAL CONTEXT ANTECEDENTS OF THE LEARNING PROCESS



3.2.1 Organizational Structure

Structure is one of the key organizational context variables associated with the nature of market information processing and learning in organizations (Desphandé and Kohli 1989; Menon and Varadarajan 1992; Desphandé 1982). As Tushman and Nadler (1978) indicate, "*Given the various sources of uncertainty, a basic function of the organization's structure is to create the most appropriate configuration of work units (as well as the linkages between these units) to facilitate the effective collection, processing, and distribution of information*"(p.614). In marketing, organizational structure is most frequently studied in terms of two aspects: centralization and formalization (e.g. Menon et al. 1999; Menon and Varadarajan 1992; Desphandé 1982; John and Martin 1984).

➢ Centralization

Centralization refers to the extent of delegation of decision-making authority and the degree of participation by organizational members in decision-making (Desphandé and Kohli 1989). According to researchers, a low level of centralization fosters information

acquisition and facilitates a high level of information utilization (Galbraith 1973; Thomas and McDaniel 1990; Menon and Varadarajan 1992). Specifically, concerning the impact of structure on scanning, Thomas and McDaniel (1990) found that decentralization is positively related to the amount of data gathered for the interpretation of strategic issues. Jaworski and Kohli (1993) also found that centralization is inversely related to the intelligence generation dimension of market orientation. The rationale behind the inverse relationship between centralization and scanning is that widespread participation in the decision-making process, and therefore low centralization, can make the task of acquiring extensive and more varied market information considerably easier (cf. Jaworski and Kohli 1993).

Centralization is also expected to affect interpretive diversity of content and frame. Research on conflict suggests that centralization increases the levels of alienation among organizational members and restrains the exchange of healthy ideas within the organization, because decision-making authority rests with relatively few individuals at the top (Menon et al 1996; John and Martin 1984). In this sense, the high levels of centralized authority imply that relatively few perspectives will be considered during the decision-making process. Hence, the limited participation of organizational members in decision-making processes is likely to be associated with low interpretive diversity of the content of market information. Furthermore, because the purpose of developing specific organizational structures is to reduce conflict or disagreement over goals as well as over the means of reaching these goals (Tushman and Nadler 1978), a highly centralized structure is likely to inhibit criticism and foster stability and consensus over the processes and criteria for ordering and evaluating market information. Hence, high levels of centralization are likely to be associated with consensus over interpretive frames. This suggests that centralization will be negatively related to unified diversity.

Finally, centralization of structure is expected to impact the level of adaptation. Generally, a decentralized structure is thought to create an environment in which the application of knowledge is eminent (Desphandé and Zaltman 1982; Desphandé 1982). John and Martin (1984) for instance, found that increased centralization in locus of authority and participation in decision-making leads to low utilization of marketing plans. In the market orientation literature, Jaworski and Kohli (1993) found that centralization is negatively related to responsiveness. Moreover, research in organizational behavior also indicates that organizations that are less centralized are

likely to adopt innovations quicker than those that are more centralized (Zaltman, Duncan and Holbek 1973). It may be therefore expected that a high level of participation and therefore low centralization of structure is likely to lead to high levels of adaptation.

Formally, with reference to centralization of structure it is hypothesized that:

H1a: The more centralized the organizational structure, the lower the degree of scanning in the decision-making process.

H1b: The more centralized the organizational structure, the lower the degree of unified diversity (i.e., high content, low frame interpretive diversity) during the decision-making process.

H1c: The more centralized the organizational structure, the lower the degree of adaptation in the decision-making process.

➢ **Formalization**

Formalization of organizational structure refers to the extent to which rules, procedures, and communications are standardized and roles are clearly defined (Menon et al 1999). This dimension of structure concerns the flexibility that organizational members enjoy in handling tasks (Desphandé and Kohli 1989). Although theory suggests that increased formalization in organizations has generally negative consequences for information processing, the empirical evidence is ambiguous. For instance, Thomas and McDaniel (1990) found that the low use of standardized procedures facilitates data acquisition for the interpretation of strategic issues. On the other hand, Jaworski and Kohli (1993) did not find support for the hypothesis that formalization has a negative impact on intelligence generation. Instead they argue that rules and procedures, if properly designed, may facilitate rather than hinder intelligence generation. This is because rules may play an important role in institutionalizing successful processes and practices associated with the acquisition of market information. Based on these empirical findings, it is proposed that formalization is likely to have a positive relationship with scanning processes.

Formalization will also impact the level of interpretive diversity in an organization. The literature suggests that increased formalization leads to high levels of rationality in planning, recruitment of planning specialists, and more formal analysis and evaluation (Fredrickson 1986; Menon et al 1999). Furthermore, Miller (1987) found a positive

relationship between formalization and the participation and involvement of organizational members from multiple groups in decision-making. This suggests that formalization is likely to be positively related with interpretive diversity of content. However, an inverse relationship is likely to exist between formalization levels and interpretive diversity of frame. The rationale for this is that the persistence of standardized processes and routines over time are likely to result in the development of consensus norms for evaluating what information is relevant and appropriate for decision-making. Because formalization also leads to dependence on previously used information and places emphasis on decisions that were successful historically (Fredrickson 1986), the frames of reference that decision makers will employ for evaluating incoming information are likely to converge towards reflecting practices that worked in the past. This suggests that a formalized structure is likely to be positively associated with unified diversity.

Finally, formalization is expected to impact the extent of adaptation. Research to date suggests that a highly formalized structure is inversely related to information utilization (Desphandé and Zaltman 1982; John and Martin 1984). Menon et al. (1999) suggest that a reason for this could be that in a formalized structure *"...efforts are expanded in the pursuit of a "document" rather than a comprehensive plan of action"* (p.24). If formalization creates a hostile environment for the utilization of information it is likely that it will also work against the adaptation of cognition in response to market information. An inverse relationship is therefore expected between formalization and adaptation.

Based on the above it is hypothesized that:

H2a: The more formalized the organizational structure, the greater the degree of scanning in the decision-making process.

H2b: The more formalized the organizational structure, the greater the degree of unified diversity (i.e., high content, low frame interpretive diversity) during the decision-making process.

H2c: The more formalized the organizational structure, the lower the degree of adaptation in the decision-making process.

3.2.2 Innovative Culture

Organizational culture has been defined as "*the pattern of shared values and beliefs that help individuals understand organizational functioning and that provide norms for behavior in the organization*" (Desphandé and Webster 1989: 4). Culture develops based on the organization's history and experiences and grows with "*those members of an organization who have shared its successful growth have developed assumptions about the world and how to succeed in it, and have taught those assumptions to new members of the organization*" (Schein 1996: 12). In this sense, organizational culture guides an organization's choice of actions as well as the means to achieve desired outcomes, including it's information processing behaviors (Moorman 1995). The extent to which an organization has a "knowledge-friendly" culture (e.g. Davenport, De Long, and Beers 1998) is thought to affect the information that it attends to, the way it interprets it, and the way it adapts its actions in response to environmental cues. "*A culture with a positive orientation to knowledge is one that highly values learning on and off the job and one in which experience, expertise and rapid innovation supersede hierarchy*"(Davenport et al. 1998:52). Because cultures that promote learning are often linked to the concept of innovation (e.g. Schein 1996; Hurley and Hult 1998; Menon and Varadarajan 1992), in order to study the impact of culture on the learning sub-processes, the construct of innovative culture is adopted (Menon et al 1999; Menon and Varadarajan 1992).

According to Menon and Varadarajan (1992) an innovative culture promotes change and innovative behavior and encourages the active exchange of ideas and knowledge. An innovative culture is thought to facilitate the gathering, sharing and utilization of information, because it creates an atmosphere of inventiveness, creativity, and willingness to take chances (Menon and Varadarajan 1992). It is therefore proposed that decision makers operating in an innovative culture will actively promote the acquisition of market information in decision-making, meaning that it will be positively associated with scanning processes.

An innovative culture is also thought to create a climate that encourages the search for multiple options and new solutions: "Such a climate increases the propensity to analyze information, fosters in-depth examination of strategic alternatives, and generates a desire to find newer and better ways to do things" (Menon et al. 1999:25). Because this type of culture motivates systematic attempts to develop, scrutinize and reconcile

divergent perspectives (Miller 1987; Menon et al. 1999), it is proposed that it will have a positive effect on interpretive diversity of content.

On the other hand, culture is likely to have an inverse relationship with interpretive diversity of frame. According to Schein (1991), the essence of a culture lies with the consensual sharing of identity, norms, and behaviors among members of an organization. In this sense, culture is thought to initiate direct construction of meaning by providing specific guides to socially acceptable beliefs, attitudes and rationale for action (Salancik and Pfeffer 1978). Hence, at a very basic level, interpretation of information will be guided by the consensual beliefs that make up the culture of the organization (Harris 1994). This suggests that culture will tend to focus decision-makers' attention on specific information and will guide the evaluation of that information through established criteria residing in the collectively held assumptions and beliefs of organizational members (Salancik and Pfeffer 1978). It is therefore expected that an innovative culture will have a positive relationship with unified diversity.

Last, a culture of innovation will be associated with adaptation. The values and ideologies residing in an organizations culture are thought to impact decision-making in many ways (Sharfman and Dean 1997). Donaldson and Lorch (1983) note that not only it provides a framework of thinking about available choices, but it also creates a powerful psychological constraint on top management's specific choices. Because innovation encourages openness to new ideas and information, top managers operating in an innovative culture are likely to be flexible in considering wider ranges of alternatives for decision-making and in re-examining their assumptions (Sharfman and Dean 1997). In this sense, organizations characterized by innovative ideologies will be likely to engage in adaptive behavior and not risk rigidity and stagnation (e.g Dean and Sharfman 1997).

In summary, the effects of innovative culture on the learning process are hypothesized as follows:

H3a: The stronger the innovative culture, the greater the degree of scanning in the decision-making process.

H3b: The stronger the innovative culture, the greater the degree of unified diversity (i.e., high content, low frame interpretive diversity) during the decision-making process.

H3c: The stronger the innovative culture, the greater the degree of adaptation in the decision-making process.

3.2.3 Interdepartmental Integration

The concept of interdepartmental integration is used to describe the state of relations among the different departments of the organization. Although integration is considered a critical aspect of marketing activities such as, new product development processes (Ottum and Moore 1997; Kahn 1996), marketing knowledge utilization (Menon and Varadarajan 1992) and the achievement of a market orientation (Jaworski and Kohli 1993), a widely shared definition is lacking. Some literature characterizes integration as extent of interaction or communication related activities (e.g. Menon and Varadarajan 1993; Menon et al 1996; Jaworski and Kohli 1993), while other literature (e.g. Lawrence and Lorsch 1986) relates integration to the level collaboration. A third viewpoint (e.g. Kahn 1996; Ottum and Moore 1997; Gupta, Raj and Wilemon 1986), proposes a multidimensional perspective of interdepartmental integration, consisting of both interaction and collaboration processes. Kahn (1996) argues that these two dimensions constitute distinct but complementary philosophies whose joint development can provide unique advantages for an organization's information processes and performance. The relationship between the interaction and collaboration dimensions and information processing is also supported by the research of Ottum and Moore (1997), who found a significant positive effect of these two dimensions of integration on information sharing and utilization. Based on this evidence, integration is defined here as a two-dimensional construct representing both interaction and collaboration.

Interaction refers to the nature and extent of communications in the form of meetings and information flows between departments. Interaction represents the more structural nature of cross-departmental activities, which include routine meetings, memoranda, routine conference calls, etc. The interaction process is thought to be structural because, by regulating the nature and frequency of communication, it adds structure to how organizational members interrelate during decision-making (Kahn, 1996). Generally, intensive interaction processes suggest frequent formal and informal communications between departments and open information exchange between managers. According to Kahn, companies ascribing to the interaction philosophy "*reflect elaborate meeting schedules and extensive information networks for the routing*

of standardized documentation" (1996: 140). In this sense, interaction activities are thought to play the role of facilitating information transactions between the different departments.

Collaboration represents the unstructured, affective nature of interdepartmental relationships, and is defined as "*an affective, volitional, mutual shared process where organizational members work together, have mutual understanding, have a common vision, share resources and achieve collective goals*" (Kahn, 1996: 139). Unlike the interaction process that focuses on transactions, collaboration stresses the continuous relationships between departments. The emphasis is on the strategic alignment of departments through teamwork, sharing of information and resources and an informal structure, for the achievement of mutual objectives.

These definitions illustrate that the interaction and collaboration processes have potentially important implications for the way organizational members' come together to acquire, interpret and act upon market information. Although neither process has ever been explicitly linked to scanning processes, Menon and Varadarajan (1992) note that in organizations with greater communication flows among departments, information is treated with less circumspection and hostility, suggesting that these organization are more likely to engage in information acquisition processes: "Organizations with greater level of general communications have less of the "not invented here syndrome" and therefore greater proclivity to collect and use new information" (p. 65). Based on this view it is proposed that interdepartmental integration will most likely have a positive effect on scanning.

Moreover, interdepartmental integration should also impact interpretive diversity of content and frame. The different organizational departments are frequently considered as independent entities or different "thought worlds" competing for company resources and as such, are expected to produce their own different interpretations of environmental events (Day 1994; Walsh 1988). In the interaction-based perspective, managers from different functions are likely to view meetings and information exchanges as negotiations, where each department carefully selects the information to be attended to and the interpretations it creates, so as to minimize costs and maximize benefits (Kahn 1996). Interdepartmental integration serves to promote effective relationships and mutual understanding across the different organizational functions.

In particular, emphasis on interaction would correspond to more meetings and increased communications between people who tend to focus their attention on different information, structure their knowledge in different ways, and apply their unique perspectives on incoming information. High levels of interaction can result in an "assembly bonus" phenomenon (Collins and Guetzcow 1964), where the group inputs result in better and more creative outcomes compared to individual or sum of individual inputs (Watson and Michaelsen 1988). Hence, the more people interact in the decision-making process, the larger and more diverse the set of ideas with which to work (Andrews and Smith 1996). Additionally, emphasis on collaboration would favour activities that build an *esprit de corps* in the organization and encourage a higher level of interrelationship among members (Kahn 1996). Collaboration cultivates a receptive setting for members of different functions to openly express and challenge each other's opinions about the meanings of market information. Because collaboration facilitates an environment of team spirit and informal communications, it is also thought to encourage functional conflict among departments, which is related to the development and expression of divergent views (Menon et al 1996). This suggests that intensive interaction and collaboration processes are likely to create an environment that promotes the development and expression of diverse interpretations of information content.

On the other hand, high levels of interaction and collaboration could also induce members to develop mutually informed mental models and to act with consensus on the information they have. Therefore, over time, high levels of interfunctional integration can lead to high frame consensus, because the emphasis is on creating shared vision and convergence among the different departments, who are likely to see it in their mutual self-interest to collaborate and avoid confrontations (e.g. Anderson and Narus 1990; Menon et al 1996).

Finally, interdepartmental integration will also impact the extent of adaptation. Several studies suggest that interaction and collaboration have a positive effect on information utilization (e.g. Ottum and Moore 1996; Maltz and Kohli 1996; Jaworski and Kohli 1993; Desphandé and Zaltman 1982). Because integration fosters a climate of cooperation, information exchange, and mutual involvement in the interpretation process, decision-makers are likely to respond to information in a concerted fashion (Kohli and Jaworski 1990). Therefore, it can be expected that the greater the extent of

interdepartmental integration the higher the levels of adaptation. Based on the above, the following hypotheses are proposed:

H4a: The greater the interdepartmental integration, the greater the degree of scanning in the decision-making process.

H4b: The greater the interdepartmental integration, the greater the degree of unified diversity (i.e., high content, low frame interpretive diversity) during the decision-making process.

H4c: The greater the interdepartmental integration, the greater the degree of adaptation in the decision-making process.

3.2.4 Political Behavior

Political behavior has long been recognized as an aspect of organizational context (Dean and Sharfman, 1996). The main assumption underlying the political dimension of the decision-making process is that people in organizations have differences in interests and that by using a variety of political techniques, they try to influence the outcomes of decisions so that their own interests will be better served (Pfeffer, 1981). "*Political behavior refers to intentional acts of influence to enhance or protect the self-interest of individuals or groups*" (Dean and Sharfman, 1996: 374). Walsh et al. (1988) note that in any attempt to understand information processing at the group level, political behavior should be considered. According to Menon and Varadarajan (1992) the overall process of knowledge utilization in organizations is political, because "*...it involves power relationships between the individual and groups that are exposed to the information and those that are affected by the utilization of the information*" (p.68). Political behavior in the decision-making process is expected to reduce effectiveness, because it often involves distortion and restriction of information flow (Cyert and March, 1992). It may also lead managers to make choices based on inadequate or incorrect information, which could also lead to poor decisions (Dean and Sharfman 1993).

According to Dean and Sharfman (1996), in political contexts attention is focused inside the organization, toward the mixture of interests, power bases and strongly held positions, rather than on outside cues. In other words, the tumultuous organizational environment resulting from a high degree of political behavior directs management's attention away from environmental scanning activities (Thomas et al 1994). Moreover,

because political processes are not oriented toward organizational goals, they are unlikely to produce complete market information for decision-making (Dean and Sharfman 1993). It is therefore proposed that that a high level of political behavior will be associated with weak scanning processes.

Political behavior is also likely to undermine interpretation because it works against "*an atmosphere in which strategic ideas can be freely championed and fully contested by anyone with relevant information*" (Burgelman 1991: 252). In political environments, attention shifts away from the content of information and focuses on how to maintain interpretive control. The most powerful members are likely to limit participation in discussion so that their own interpretations are likely to be adopted (Corner et al 1994). In this sense, they are likely to shape the content and number of meanings created during the interpretation process (Walsh et al 1988). In such cases the most powerful group member usually proposes a specific meaning and presses for commitment to it, thereby constraining the suggestions of others (Corner et al. 1994). This suggests that in political contexts, organizational members will have a limited capacity to construct shared meaning based on multiple and diverse interpretations – producing low content diversity. On the other hand, the intense levels of conflict associated with political behavior (Dutton et al 1993), suggest that decision-makers are also unlikely to agree on framing information along similar lines. "*Multiple interpretations result, and executives may direct their attention and effort toward lobbying and confrontational activities in order to get support for their particular interpretations*" (Thomas et al. 1994: 1258). Information interpreted in a political environment will be perceived as having political implications further inducing conflict on interpretive frames (Thomas et al 1994). Managers who are pursuing their own interests are likely to work towards undermining the credibility and relevance of information acquired by others. This suggests that political behavior is likely to be associated with high frame diversity. Taken together the facts that political behaviour is likely to produce low content diversity and high frame diversity, it is proposed that this variable will be inversely related to unified diversity.

Finally, political behavior is likely to undermine the level of adaptation. According to Nutt (1993), political processes may introduce additional constrains in the process of generating solutions. For example, an attempt to select a particular course of action in light of environmental information may be eliminated because of the opposition of a powerful individual. Because political processes are organized around the self-interests

of individuals or groups they typically prevent managers to re-examine their positions or adapt decision-making in response to external information. In this sense, "*political processes may rule out viable choices, further reducing the likely success of the strategic decisions they produce*" (Dean and Sharfman 1996: 375). Based on the above, the following hypotheses are proposed:

H5a: The greater the level of political behavior, the lower the degree of scanning in the decision-making process.

H5b: The greater the level of political behavior, the lower the degree of unified diversity (i.e., high content, low frame interpretive diversity) during the decision-making process.

H5c: The greater the level of political behavior, the lower the degree of adaptation in the decision-making process.

3.2.5 Organizational Memory

Organizational memory refers to the collective beliefs, routines, and other physical artifacts that reflect the presence of stored knowledge (Moorman and Miner 1997, 1998). The development of organizational memory is critical because it prevents organizations from repeating past mistakes. Memory mechanisms are needed to remember what worked and what didn't, and to ensure that useful lessons are captured, conserved and retrieved when needed (Walsh and Ungson, 1991). In essence, organizations use memory both as a storage device and as a sorting mechanism for identifying successful practices (Dixon, 1992). The construct of memory is central to organizational learning, because what organizations already know affects what they pay attention to and how they interpret incoming information (Huber 1991; Sinkula 1994).

Theoretical work (e.g. Moorman and Miner 1998; Walsh and Ungson 1991) distinguishes between two different types of organizational memory: (1) declarative memory, referring to the stored facts, concepts, and associations that represent our general knowledge of the environment and (2) procedural memory, referring to the stored skills and routines of how things are done. However, according to Moorman and Miner (1997), the distinction between declarative and procedural memory concerns only the content dimension of memory, whereas memory can also be described according to level, dispersion and accessibility. In this view, level refers to the amount of stored

information and experience that an organization has about a particular phenomenon, dispersion refers to the degree to which memory is widely shared in the organization, and accessibility refers to the extent to which memory can be retrieved for use. Given the lack of previous research on the nature and effects of the four organizational memory characteristics on the learning process, the focus here is with developing hypotheses concerning impact of the overall organizational memory level on scanning, unified diversity and adaptation. As a rule, the Moorman and Miner (1998) view is taken, that treats declarative and procedural memory as complementary competencies whose joint development permit the organization to improve its ability to acquire, interpret and put incoming information into action.

Sinkula (1994) suggests that the way an organization employs its environmental scanning processes is a function of how much it already knows. He also notes that because organizational memory serves as a market information filter, it can lead to selective attention to information that confirms historical patterns. However, because organizational memory tends to increase with time, the wealth of accumulated knowledge, i.e., a rich declarative memory, is likely to be associated with organizational environments that foster and value market information acquisition (Moorman and Miner 1998). In addition, because procedural memory is about the development of automatic skills and routines, it may enhance an organization's habitual processes for scanning the environment (Moorman and Miner 1997). In other words, as procedural memory develops, it enhances an organization's ability to *promptly* search for and import new information (Cohen and Levinthal 1994). It is therefore suggested that a well-developed declarative and procedural memory, will have a positive effect on an organization's propensity and ability to scan the external environment.

Generally, the ability of an organization to evaluate and interpret incoming information is considered a function of the level of prior knowledge that the organization possesses (Cohen and Levinthal 1990). The existence of a diverse body of knowledge already held by organizational members permits richer and more complex meanings and connections to emerge during the process of interpreting new information. In this sense, a well-developed declarative memory is seen as having the "*generative potential for suggesting new meanings, new interpretations, or new linkages between concepts and action*" (Moorman and Miner 1998:712). This is because rich knowledge pools increase the likelihood that organizational members will relate new information to what is

already known, by constructing new, multiple and diverse meanings of the incoming information content. This suggests that a well-developed declarative memory will have a positive effect on interpretive content diversity.

Moreover, interpretation of incoming information will be also affected by the stored cognitive skills and routines that constitute procedural memory. As noted above, the distinctive characteristic of procedural memory is that it has close links to notions of automatic skills and habits. "*It is memory of how things are done that is relatively automatic and inarticulate, and it encompasses cognitive as well as motor abilities*" (Cohen and Bacdayan 1994: 554). The beliefs embedded in these shared evaluation routines and are likely to determine the usefulness and value of new information (Choo 1998). As procedural memory develops, organizations become more skilled at separating relevant from irrelevant information and at reducing equivocality of information (Sinkula 1994). Hence, a well-developed procedural memory is necessary to ensure that that established capabilities and routines are in place for organizational members to evaluate and assess incoming market information. It is therefore suggested that higher levels of procedural memory will be associated with low frame diversity. Combining the effects of declarative and procedural memory, it is proposed that overall organizational memory level will have a positive effect on unified diversity.

Finally, the extent to which an organization will adapt in response to the market information will also depend on its level of prior knowledge and experience. Because learning is cumulative, the wealth of preexisting knowledge, i.e., declarative memory, and the skill to recall, sort and employ that knowledge, i.e., procedural memory, are thought to improve an organization's ability to put new information into action. As Cohen and Levinthal note: "*fortune favors the prepared firm*" (1994: 237). Moorman and Miner (1998) also suggest that the joint development of procedural and declarative memory leads to new linkages between meanings and action. Specifically, they propose that the degree to which an organization can produce novel action may depend on its ability to combine declarative memory with the creative use of procedural memory. This view is also supported by Anderson (1983) who found that subjects with high levels of declarative memory are likely to perform well when they also know which behavior to employ given certain problem conditions. Moreover, a well-developed declarative memory complemented by the use of procedural memory is also thought to ensure that the organization will engage in processes of unlearning (Dixon 1992; Cyert and March

1992), by encouraging organizational members to continuously construct new interpretations about environmental events while converging around established successful practices. It is therefore proposed that a combination of high declarative and procedural memory is likely to result in high levels of adaptation. Based on the above, the following hypotheses are proposed:

H6a: The greater the level of organizational memory, the greater the degree of scanning in the decision-making process.

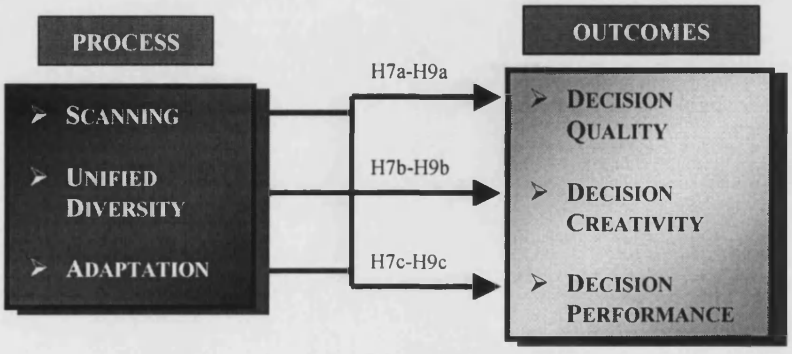
H6b: The greater the level of organizational memory, the greater the degree of unified diversity (i.e., high content, low frame interpretive diversity) during the decision-making process.

H6c: The greater the level of organizational memory, the greater the degree of adaptation in the decision-making process.

3.3 Marketing Decision Outcomes of the Learning Process

In this section the relationship between the learning process and marketing decision outcomes is discussed with a view to proposing hypotheses relating to the following question: What is the impact of the organizational learning processes, i.e., scanning, unified diversity and adaptation on an organization's marketing decision effectiveness? In total, three variables make up the marketing decision outcomes, i.e., decision quality, decision creativity, and decision performance. The anticipated linkages with the learning sub-processes are presented in Figure 3.3 below, while each variable is discussed in turn in the following sections.

FIGURE 3.3: MARKETING DECISION OUTCOMES OF THE LEARNING PROCESS



3.3.1 Effects of Scanning

The process of market information acquisition is considered critical for decision performance because without it, there is no opportunity for the firm to keep abreast of its customer and competitor environments (Sinkula et al. 1997). However, very little is known about the effect of scanning processes on decision outcomes, although the general belief is that the more information organizations possess the better decisions they are likely to make (Feldman and March 1981). Information acquisition processes should lead to greater decision performance because they provide the vital input in the identification of market opportunities or threats that facilitate strategy development (Fahey and Naraynan 1986). Moreover, lack of market information acquisition or an inadequate process of gathering information is often cited as a cause of poor marketing decisions in new product introductions (e.g. Ottum and Moore, 1997), although Moorman (1995) did not find a significant relationship between information acquisition and new product timeliness and performance. Overall, arguments tend to support the proposition that there is a positive link between market information acquisition processes and decision outcomes. Bearing in mind the absence of empirical evidence on this issue, the following tentative hypotheses are presented:

H7a: The greater the degree of scanning in the decision-making process, the greater the decision quality.

H7b: The greater the degree of scanning in the decision-making process, the greater the decision creativity.

H7c: The greater the degree of scanning in the decision-making process, the greater the decision performance.

3.3.2 Effects of Unified Diversity

As noted in the previous chapter, the nature of interpretive diversity will vary depending on the level of interpretive diversity of content and frame during the shared meaning creation process. According to Fiol (1994), the combination of the two meaning dimensions that is likely to produce superior learning outcomes emerges from high interpretive content diversity and low interpretive frame diversity, in other words from a state of unified diversity, that is, of "*embracing diverse pictures of what is thought to be true within a unifying frame*" (Fiol 1994: 406). The achievement of unified diversity

over time, suggests an ability to constantly renew decision-makers' mental models, which enable the organization to stay alert to environmental changes and respond with creative solutions (Barr, Stimpert, and Huff 1992). In the past, decision quality has been positively linked to cognitive diversity (Amason 1996) and dissent (Dooley and Fryxell), suggesting that the conceptually related construct of unified diversity should also have a positive effect on decision quality. Moreover, the interpretation process has often been linked with organizational renewal, change and the ability to take creative action (e.g. Crossan et al. 1999; Barr et al. 1992, Ford and Ogilvie 1996), further supporting the position that unified diversity will have a positive effect on decision creativity. An overall positive effect on the three decision outcomes is therefore expected:

H8a: Unified diversity (high content, low frame interpretive diversity) is associated positively with decision quality.

H8b: Unified diversity (high content, low frame interpretive diversity) is associated positively with decision creativity.

H8c: Unified diversity (high content, low frame interpretive diversity) is associated positively with decision performance.

3.3.3 Effects of Adaptation

The link between effective action and successful performance is a fundamental presumption in the literature (Thomas et al. 1993). Because the construct of adaptation captures both level of information utilization and change in action, its relationship to decision outcomes can be better understood through the linkages that these two components have with performance.

Dean and Sharfman (1996) argue that in order for a decision process to result in an effective decision, it must be based on effective information utilization. Managers who conduct and rely upon information analysis in making their choices will have more accurate perceptions of the environmental conditions, which in turn has been shown to relate to superior firm performance (Bourgeois, 1985). This is also supported by the market orientation literature, where a basic argument is those companies that track and respond to marketing intelligence on their customer needs and preferences can perform at higher levels (Jaworski and Kohli 1993). Hence, information application processes are

thought to have a positive effect on performance by influencing the effectiveness of decision-making processes (Moorman 1995; Glazer 1991).

Change in action has also been associated with superior performance. For instance, Barr et al. (1992) point to the existence of a linkage between changes in managerial cognitions/actions and performance outcomes. This view is empirically supported by Thoams et al (1993), who found that frequent organizational responses are associated with increased profitability. Generally, it is believed that action, as an outcome measure of learning, encourages, and even requires, employees to constantly question the theories and norms that guide their choices: "*Firms that have enhanced learning orientations are more willing to question long-held assumptions about their fundamental philosophies*" (Baker and Sinkula 1999: 415). In this sense, the process of adaptation is linked to decision effectiveness because it has the effect of constantly encouraging improvement and renewal of managers' thinking about marketing problems (Moorman 1995). Overall, organizations that are able to adapt their cognitions to reflect changing market conditions in decision-making are more likely to produce more effective decisions than those who do not. Based on this, the following is proposed:

H9a: The greater the degree of adaptation in the decision-making process, the greater the decision quality.

H9b: The greater the degree of adaptation in the decision-making process, the greater the decision creativity.

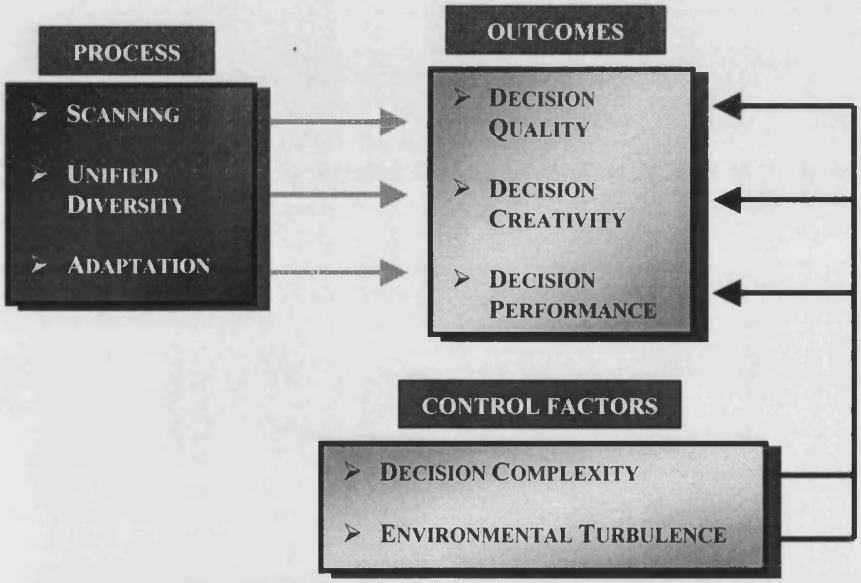
H9c: The greater the degree of adaptation in the decision-making process, the greater the decision performance.

3.4 Control Variables

In order to more fully specify the model it is necessary to consider the impact of external factors, that is, factors that affect decision effectiveness, but are outside management's immediate control (Dean and Sharfman 1996). In this section the impact of two control variables on an organization's marketing decision effectiveness is discussed, decision complexity and environmental turbulence. The two constructs were chosen based on literature (e.g Menon and Varadarajan 1992) suggesting that research in strategy and learning should control for task complexity and the environment. Moreover, these two

variables are seen as distinct, yet related, constructs that co-vary together. This is because, based on the law of requisite variety (Ashby 1956), the internal diversity of a self-regulating system must match the diversity of its environment in order to survive. In this sense, managers facing turbulent environments are expected to employ more complex decisions. The anticipated linkages with decision-outcomes are presented in Figure 3.4 below, while each variable is discussed in turn in the following sections. Due to the absence of prior literature on the nature of the effects of these two variables and because they are controls, therefore external to the main focus of the study, no explicit hypotheses are developed. Rather a discussion of the nature of each variable is presented and its proposed relationship with the outcome variables is explicated. The linkages to be explored are represented by the black arrows in Figure 3.4 below.

FIGURE 3.4: THE IMPACT OF CONTROL VARIABLES



3.4.1 Decision Complexity

The complexity level involved in a task or decision has been shown to play an important role in information processing (Sternthal and Craig 1982; Tushman and Nadler 1977), knowledge utilization (Menon and Varadarajan 1992; Wilton and Meyers 1984; Dunn 1980), and task/decision planning and execution (Van De Ven and Ferry 1980;Tushman and Nadler 1977).

Van de Ven and Ferry (1980) propose two dimensions of task complexity: (1) *task difficulty*, referring to the degree to which the work or decision at hand is considered analyzable and its outcome predicted, and (2) *task variability*, referring to the extent of exceptions encountered in the work. The former affects the amount of expertise, discretion and adjustment needed to make and carry out a specific decision, while the latter affects the extent to which decision processes can be structured in a standardized way (Menon and Varadarajan 1992; Van De Ven and Ferry 1980).

Task complexity is an important controlling factor in a study of learning and decision-making, because it accounts for the amount of inherent uncertainty with which a team must deal in making and implementing a decision. In the problem-contingent model (e.g. Dunn 1980), variations in knowledge application are seen to be determined by the appropriate match of processes to types of problems (Churchman 1971). As decision variability and decision difficulty increase, they add to the overall uncertainty associated with the specific decision, thereby increasing the need for information and the propensity of interactive interpretation. Moreover, as decision complexity increases, "...managers tend to use more of the information to reduce the uncertainty and lack of clarity" (Menon and Varadarajan 1992: 64), therefore, adaptation is also likely to increase to match the complexity of the task at hand (e.g. Walsh, Henderson and Deighton 1988). Hence, following Menon and Varadarajan's (1992) recommendation that research in knowledge utilization should control for the task, decision complexity is included as a control variable.

As far as the impact of decision complexity on the specific decision outcomes is concerned, the literature offers little guidance. Generally, complex decisions are likely to be associated with creative outcomes, given the novelty involved in carrying out new tasks (e.g. Andrews and Smith 1996, Moorman 1995). On the other hand, because high levels of complexity entail increased variability, i.e., a large number of encountered exceptions, decision quality is likely to be undermined, due to the potential difficulties associated with the implementation and timeliness parameters of quality. Finally, high levels of decision complexity entail increased unpredictability of outcomes, which in turn impacts the planning process and therefore negatively affects performance measures relating to the achievement of intended results.

3.4.2 Environmental Turbulence

Environmental turbulence refers to the extent that demand, competition and technology are rapidly changing in an organization's market (e.g. Dess and Beard, 1984). High environmental turbulence indicates fluctuating customer preferences, intense competition and the introduction of new technologies at a rapid pace (Jaworski and Kohli 1993). The environment has been shown to play an important role in decision-making processes and effectiveness (Dean and Sharfman 1996), impacts marketing strategy making and performance (Menon et al. 1999), influences the nature and extent of organizational learning (Menon and Varadarajan 1992; Sinkula 1994, Slater and Narver 1995), and affects creativity (Moorman and Miner 1998).

Generally, in turbulent environments managers who fail to systematically collect and analyze information about market trends and constraints are likely to make ineffective decision choices (Dean and Sharfman, 1996). This is also supported by the Daft et al. (1988) findings that successful firms are more likely to collect and analyze additional information in dynamic environments, than unsuccessful firms. These findings suggest that that environmental turbulence affects the need for more information and therefore the organization's propensity to seek, interpret and respond to market information. Hence, based on linkages between the environment, learning and performance, environmental turbulence is incorporated as the second controlling variable.

As with the case of decision complexity, environmental turbulence has never been explicitly linked with the three decision outcomes discussed in this model. Prior research (e.g. Menon et al. 1999; Moorman and Miner 1998), suggests that firms respond with more creative solutions in turbulent environments, implying that environmental turbulence is likely to have a positive effect on decision creativity. On the other hand, in unstable environments conditions are not well understood and therefore cannot be easily factored into decisions, meaning that turbulence can easily hurt decision quality and performance.

3.5 Synopsis

A model of organizational context antecedents and decision consequences of the learning process in organizations has been developed around the framework of unified

diversity. The organizational level variables posited to influence the learning processes include an organization's structure, level of innovative culture, interdepartmental integration, extent of political behavior, and organizational memory. The proposed outcomes of the model are related to marketing decision-making and include: decision quality, decision creativity and decision performance. Finally, two additional variables, environmental turbulence and decision complexity were incorporated as the control variables of the framework. Having built a model of the learning process, the focus now turns to its confirmation. The following chapters are concerned with the research methodology employed to empirically test the model and the corresponding results.

CHAPTER 4

RESEARCH METHODOLOGY

CHAPTER 4

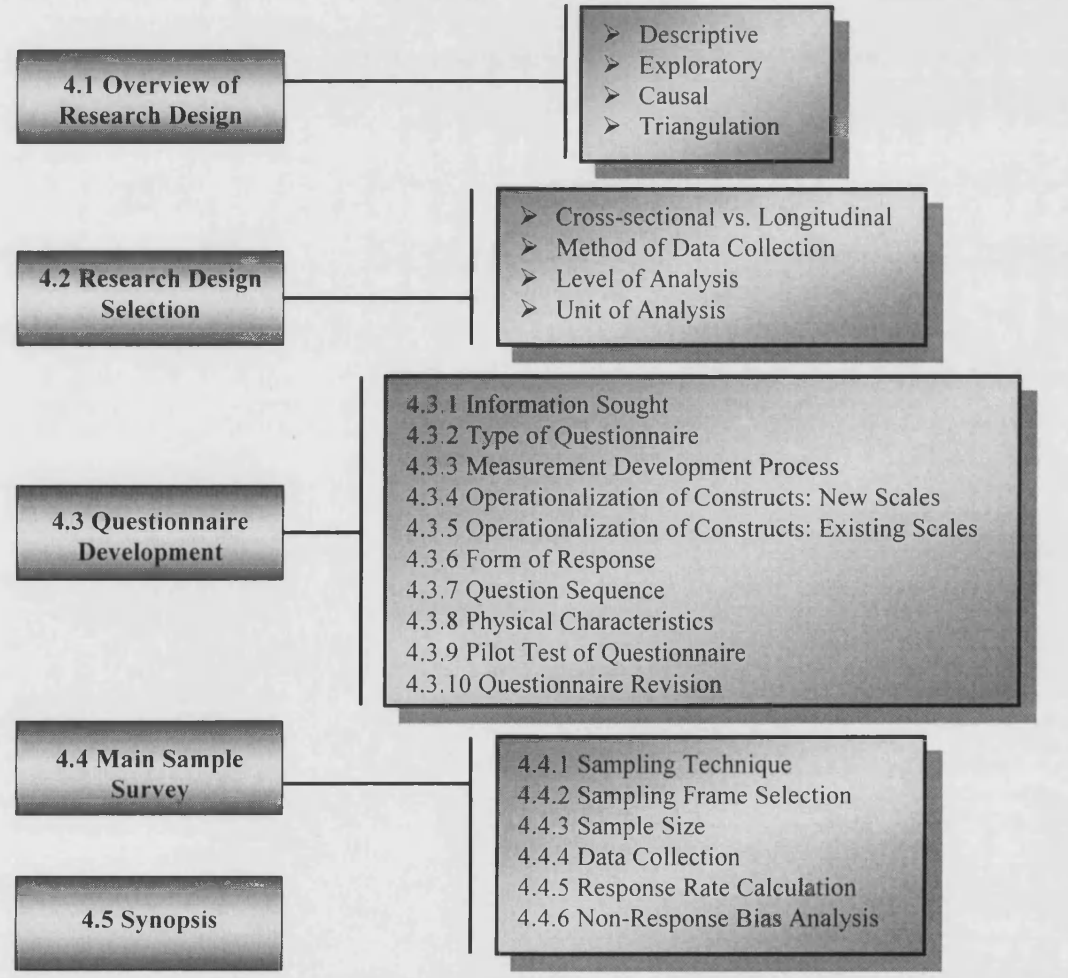
RESEARCH METHODOLOGY

"And what he greatly thought, he nobly dared."

Homer
Iliad (750 B.C.)

This chapter describes the methodology employed to test the theoretical model and hypotheses presented in the previous chapter. Specifically, the logic and the overview of the research design of the study are presented and the steps in collecting the data are discussed. Consistent with the methodology of a positivist framework, an instrument was used to collect the data from a sample of the population. The process of developing the questionnaire is described with particular attention to the issue of construct operationalization. Finally, the design of the survey and the sampling and field procedures of data collection and evaluation are presented. The chapter is organized in five main sections, outlined in the figure below:

FIGURE 4.1: CHAPTER OUTLINE



4.1 Research Design: An Overview

The design of a research study is a critical methodological decision area in empirical research that consists of the specification of procedures for collecting and analyzing data (Kinnear and Taylor 1991). Simply put, a research design is the framework or plan, used as the blueprint to be followed in completing a study. It "*deals primarily with the aims, uses, purposes, intentions and plans within the practical constraints of location, time, money and availability of staff*" (Hakim 1987:1). Thus, a research design is necessary to ensure that the study will be relevant to the research problem and will use economical procedures (Churchill 1991).

In terms of the fundamental objective of the investigation, research designs can be classified into three basic types: exploratory, descriptive, and causal (Krausz and Miller 1974). These are briefly described in turn.

➢ Exploratory

The exploratory study is particularly appropriate in situations where initial ideas and insights into a problem are required. Churchill (1991) suggests that an exploratory study is used for any or all of the following purposes:

- Formulating a problem for more precise investigation or for developing hypotheses;
- Establishing priorities for further research;
- Gathering information about the practical problems of carrying out research on particular conjectural statements;
- Increasing the analyst's familiarity with the problem;
- Clarifying concepts.

Particularly productive in exploratory research is the use of (1) *literature search*, that may involve conceptual literature, trade literature, or published statistics, (2) *qualitative research*, involving key informant unstructured interviews or focus group sessions, and (3) *analysis of selected cases*, which is suited for situations where cases reflect changes and the order in which events occur over time (Aaker and Day 1983; Churchill 1991).

➢ **Descriptive**

Descriptive research is typically concerned with determining the frequency with which something occurs or the relationships between variables. The intent of a descriptive study is to develop generalizations that contribute to the theory and that enable researchers to predict, explain, and understand a particular phenomenon (Creswell 1994). It is used when the purpose of the study is:

- To describe the characteristics of certain groups;
- To estimate the proportion of people in a specified population who behave in a certain way;
- To make specific predictions.

(Churchill 1991: 144)

Descriptive studies can be categorized according to their longitudinal or cross-sectional design. Longitudinal criteria are dynamic and rely on methods where data are generated from a fixed sample of estimates and are measured repeatedly over time (Kinnear and Taylor 1991). Cross-sectional research is associated with a sample of units that are measured to capture variations of the addressed issues at a specific point in time (Kinnear and Taylor 1991).

➢ **Causal**

Finally, in causal research the researcher is faced with cause and effect questions. The main task in this type of research is to isolate cause and to judge to what extent it is related to effect (Oppenheim 1992). In other words, the purpose is to assess the extent that changes in a given variable X produce changes in another variable Y (Hakim 1987). Causal research requires that the problem under investigation is well structured and that an experimental design is employed. An experiment refers to *" a scientific investigation in which an investigator manipulates and controls one or more independent variables and observes the dependent variable or variables for variation concomitant to the manipulation of the independent variables*" (Kerlinger 1986: 293). Given that researchers are able to control at least some manipulations of the causal variable, they can be more confident that the cause and effect relationships discovered are indeed true relationships.

Because of the control it affords researchers, an experiment is considered as having greater ability to supply evidence of causality compared to the *ex post facto*[1] exploratory and descriptive designs (Churchill 1995). In ex post facto research designs, the researchers attempts to identify causal variables Xs that explain why Y takes place, after Y has already occurred. This kind of retrospective analysis offers little evidence about the time/order of occurrence of the independent variables, while it systematically excludes other possible explanatory variables of the phenomenon, making exploratory and descriptive designs more suspect for establishing causality (Churchill 1995).

➢ **Triangulation**

Although the suggested classification of research design types is useful for gaining insight into the research process, the distinctions are not absolute. Indeed, the three basic designs can be seen as stages in a continuous process (Churchill 1991). While the common suggestion of the sequence would be from exploratory to descriptive to causal research, alternative sequences may occur. For instance, the tentative propositions formulated from the exploratory research might be so generally accepted that the sequence could be from exploratory to causal. Alternatively, an exploratory study may be carried out after a descriptive study, since qualitative research can give the researcher in-depth insight into the meaning of behaviour and attitudes expressed in surveys (De Vaus 1986). In this sense, it may be argued that, given its feasibility, triangulation offers a way to overcome some of the limitations associated with each method of data collection and increase the validity of the research findings. As a research strategy, triangulation has the benefit of raising social scientists "*above the personal biases that stem from single methodologies. By combining methods in the same study, observers can partially overcome the deficiencies that flow from employing one investigator or one method*" (Denzin 1989 in Nachmias and Nachmias 1996:206).

4.2 Research Design Selection

Each of the forms of research design discussed above has certain unique advantages and also some inherent limitations, so the process of identifying and selecting the most appropriate research strategy for a study must be driven by the nature of the research

[1] Ex post facto, i.e., from what is done afterward.

objectives, as well as the time, skills and resource constraints (Creswell 1994). Yet, "*the crucial tenet of research is that the design of the investigation should stem from the problem*" (Churchill 1991:129). In this case, the research objective was to (1) develop and (2) test a model of organizational context antecedents and decision outcomes of the organizational learning process.

The development of a theoretical model points to the need for an exploratory investigation for defining the constructs that make up the model and for developing hypotheses about the relationships between the model variables. The exploratory investigation started with a review of the literature on organizational learning, which revealed that (1) a large body of theory on the learning and interpretation processes already exists and (2) that the appropriate method for exploring learning and interpretation at the organizational or group level requires the application of an observation rather than communication (i.e., personal interviews, focus groups, etc.) methodology (e.g. Isabella 1990; Fiol 1994). Moreover, the Daft and Weick (1984) theory of organizations as interpretation systems and Fiol's exploratory study (1994) on diversity and learning presented clear constructs and explicit theoretical propositions for developing the model. Hence, given that (1) the core research question was already identified by Huber (1990) and explored by Fiol (1994); (2) the constructs describing the learning process clearly defined by Daft and Weick (1984); (3) the context in which learning takes place partly explored by other researchers (e.g. Thomas et al. 1993; Moorman 1995); and (4) the time and skill constraints for pursuing an observatory investigation, it was decided to develop the theoretical model and hypotheses based on the literature review and proceed directly to the stage of empirically testing the model.

Once variables are known and theoretical propositions are developed, theory verification can take place by employing either a descriptive or an experimental design (Creswell 1994). In this instance, experimental research was not a feasible option, as randomisation and controlled application of the organizational context antecedents is extremely difficult, if not impossible, to replicate in a laboratory setting. According to O'Reilly (1983), laboratory experiments typically fail to capture the context in which most organizational decision-making takes place, as "d*ecision-makers in the laboratory are usually focused on a limited information set, pursuing a single goal, and have little or no long-term vested interest in the outcomes of the experiment. In actual organizations almost the opposite is true, with decision makers exposed to large*

quantities of information, pursuing multiple goals, and highly vested in the consequences of their decisions " (p. 104). A second reason precluding an experiment was the lack of the appropriate resources (e.g. MARKSTRAT software, access groups of executives). Hence, the model was tested using a descriptive design, employing a sample survey methodology.

The purpose of survey research is to generalize from a sample to a population, so that inferences can be made about the population's characteristics, attitudes or behaviors (Babbie 1990; Croswan 1994). Survey research offers the advantages of economy of design, rapid data collection, and the ability to identify attributes of a population from a small group of individuals or organizations (Babbie 1990). With reference to designing the survey, three issues needed to be addressed: (1) a cross-sectional vs. a longitudinal design, (2) the method of data collection, and (3) the level and unit of analysis.

➢ **Cross-sectional vs. Longitudinal**

Given the time constraints and the secondary objectives of the thesis to develop measures for the constructs in the learning process, particularly interpretive diversity and adaptation, a cross sectional design was selected. According to Kinnear and Taylor (1991), measurement development processes warrant the use of a representative sample and longitudinal studies are considered weak in this respect. On the other hand, one of the limitations of the cross-sectional design is that causality cannot be established. However, pursuing a longitudinal study, which would increase confidence in the causal interpretation of findings, was not feasible due to the time constraints of the thesis.

➢ **Method of Data Collection**

There are many cross sectional survey methods of data collection available to the researcher, including face-to-face personal, telephone, mail, and computer interviews (Tull and Hawkins 1993). Given the lack of resources and facilities, computer interviewing was clearly not a feasible option. As the population of the study is spread throughout the UK, personal interviewing was also deemed inappropriate due to time and resource constraints. Telephone interviewing was also excluded since the amount of information that can be obtained by telephone is restricted (e.g. Kinnear and Taylor 1993). It was, therefore, decided to use the mail survey technique using a structured questionnaire. The advantages of structured questionnaires are that they can be applied

to diverse populations, they take less time and effort to respond, ensure respondents' anonymity, and minimize interviewer bias (Parasuraman 1986). Another advantage is the low cost in the administration of the survey (Nachmias and Nachmias 1996). Finally, structured questionnaires also offer the advantages of simple administration, easy tabulation, and data analysis (Churchill 1995). On the other hand, the principal weakness of the method is the risk of getting a low response rate. Moreover, although sampling may ensure that a sufficiently large and representative number of people are contacted, it does not ensure that respondents are paying attention equally or are otherwise responding similarly (Calder 1994). With this form of data collection there is no opportunity to probe beyond the given answer, to clarify ambiguous answers, or to allow the interviewee to explore the issue in his/her own terms. Finally, "*response errors due to question wording, order of questions, and many other factors may extend the error range of surveys well beyond sampling error*" (Bradburn 1983; in Calder 1994:69).

➢ **Level of Analysis**

With reference to the level of analysis it was decided to collect the data by using the key informant approach (e.g. Menon et al. 1999). Although it has been suggested that a study must capture the perceptions of multiple informants (Philips 1981), especially one that measures diversity, Miller et al. (1998) found that cognitive diversity measured through asking only the key informant is a reasonable proxy for assessing the actual diversity among the top management team (TMT). Specifically, the authors found that obtaining perceptions of diversity from the key informant, yielded the same results as obtaining objective data from each executive and concluded that, "*it appears that collecting data from each upper-echelon executive is not always required*" (p. 52). Hence, based on the Miller et al. (1998) findings, as well as on research (c.f. Menon et al. 1999) suggesting that senior managers provide data that are as reliable and valid as multiple informants and objective data do, it was decided to use the single respondent approach for data collection.

➢ **Unit of Analysis**

Finally, the unit of analysis would be the strategic marketing decision. In other words, the objective would be to trace a decision back to its roots and examine the ways in

which information was acquired for, interpreted during, and influenced the decision-making process. According to Menon and Varadarajan (1992), this approach has the potential for more objectivity in response, because of the specificity required in the tracing process – although when applied *ex post facto* it raises questions about priming effects[2] (Yi 1990). Moreover, previous research has shown that when studying decision effectiveness as the dependent variable, it is preferable to use decisions rather than organizations as the unit of analysis, because decision processes within a given organization often vary substantially (Dean and Sharfman 1996).

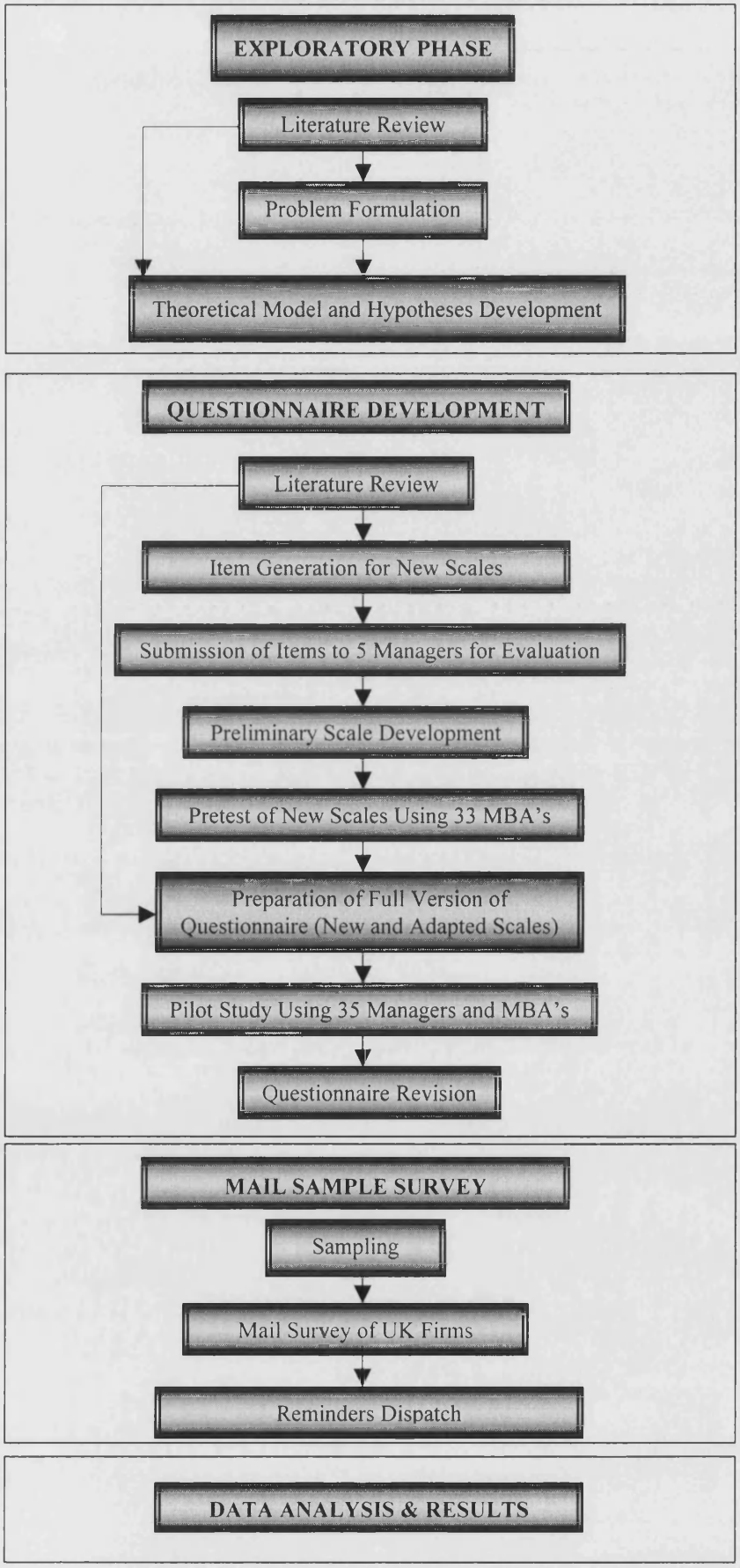
➢ The Research Design

Figure 4.1 summarizes the research design. A standard procedure for measurement development was followed consisting of the following steps:

1. The existing literature was reviewed for scales designed to measure the constructs in the study. The review revealed that there were no scales for measuring interpretive diversity, adaptation, procedural / declarative memory, decision quality, and decision creativity. Hence, a large pool of measurement items for these constructs was generated based on the literature and from similar constructs.
2. A list of the items for the new scales was submitted to 5 managers to evaluate for clarity, specificity, and representativeness and to produce additional items if necessary.
3. On the basis of the feedback from the managers measurement, scales for the five constructs were produced that were pretested using 33 MBA students.
4. Following the pretest, the new measures were modified and the full version of the questionnaire, including the five new and the nine literature adapted scales, was drafted.
5. The questionnaire was pilot tested using 35 MBA's and managers. After the pilot study, the questionnaire was revised accordingly and was administered to a sample of companies for the main survey.

[2] A priming effect would describe a situation in which a manager who was in favour of the final decision would describe information processing differently than one would was not in agreement with the decision (c.f. Menon and Varadarajan 1992).

FIGURE 4.1: RESEARCH DESIGN OVERVIEW



4.3 Questionnaire Development

4.3.1 Information Sought

The information sought in the questionnaire was determined from the theoretical model and hypotheses outlined in Chapter 3. Questions were asked regarding the organizational context, i.e., organizational structure, innovative culture, interdepartmental integration, political behavior, and organizational memory; the learning process, i.e., scanning, interpretive diversity, and adaptation; the overall decision effectiveness, i.e., decision quality, decision creativity, and decision performance; and the control variables, i.e., decision complexity and environmental turbulence. In addition to the model variables, respondents were also asked to describe a strategic marketing decision and to provide some general information regarding their organization and their position, as described below.

- **Strategic Marketing Decisions**

Respondents were asked to describe a marketing decision based on the following two criteria. First, the decision had to be strategic, in other words important enough for the learning sub-processes to be visibly and specifically instigated. In the management literature strategic decisions have been described as committing substantial resources, setting precedents, and creating subsequent decisions (Mintzberg et al. 1976); ill-structured, non-routine, and complex (Scwenk 1988); and as substantial, unusual, and all-pervading (Hickson et al. 1986). Although theorists have not reached consensus as to what constitutes a strategic decision, Dean and Sharfman (1996) report that managers have no trouble identifying them. The second requirement was that the decision had to be sufficiently recent so that memory about the learning sub-processes would be intact, but not too recent so that performance evaluation would not be premature. Therefore, respondents were asked to describe the most recent strategic marketing decision that was made and implemented in their organization and for which performance indications were available.

- **Company and Position Characteristics**

General company characteristics were sought for classification and validation purposes and these include company age, size by number of employees, and sector of activity. Moreover, two position characteristics were sought to verify the key informants'

competence. The first question assessed whether the respondent's position in the organization justified involvement in the reported strategic marketing decision. The second question assessed knowledge by using respondent experience (i.e., number of years in the company) as a proxy for knowledge (Menon et al. 1999).

4.3.2 Type of Questionnaire

"After specifying the basic information that will be sought, the researcher needs to specify how it will be gathered"(Churchill 1991:361). As described in the previous section, the mail sample survey requires that a structured approach to respondent questioning be adopted. Moreover, with reference to the disguise of the research instrument, the purpose of the study was made explicit, as there was no reason to conceal the research objectives from respondents.

4.3.3 Measurement Development Process

According to Churchill (1979), when developing multi-item measures of marketing constructs, a sequence of steps needs to be followed (Figure 4.2). The first step involves specifying the domain of each construct, i.e., determining each construct's definition. The second step in the process is to generate items that capture each specified domain. The techniques used for item generation include literature search, experience surveys, focus groups, and critical incidents (Churchill 1979). After the review of the literature it became evident that new scales needed to be developed for the following constructs: organizational memory, interpretive diversity, adaptation, and decision quality and creativity. For the rest of the constructs in the model, established scales were available in the marketing literature.

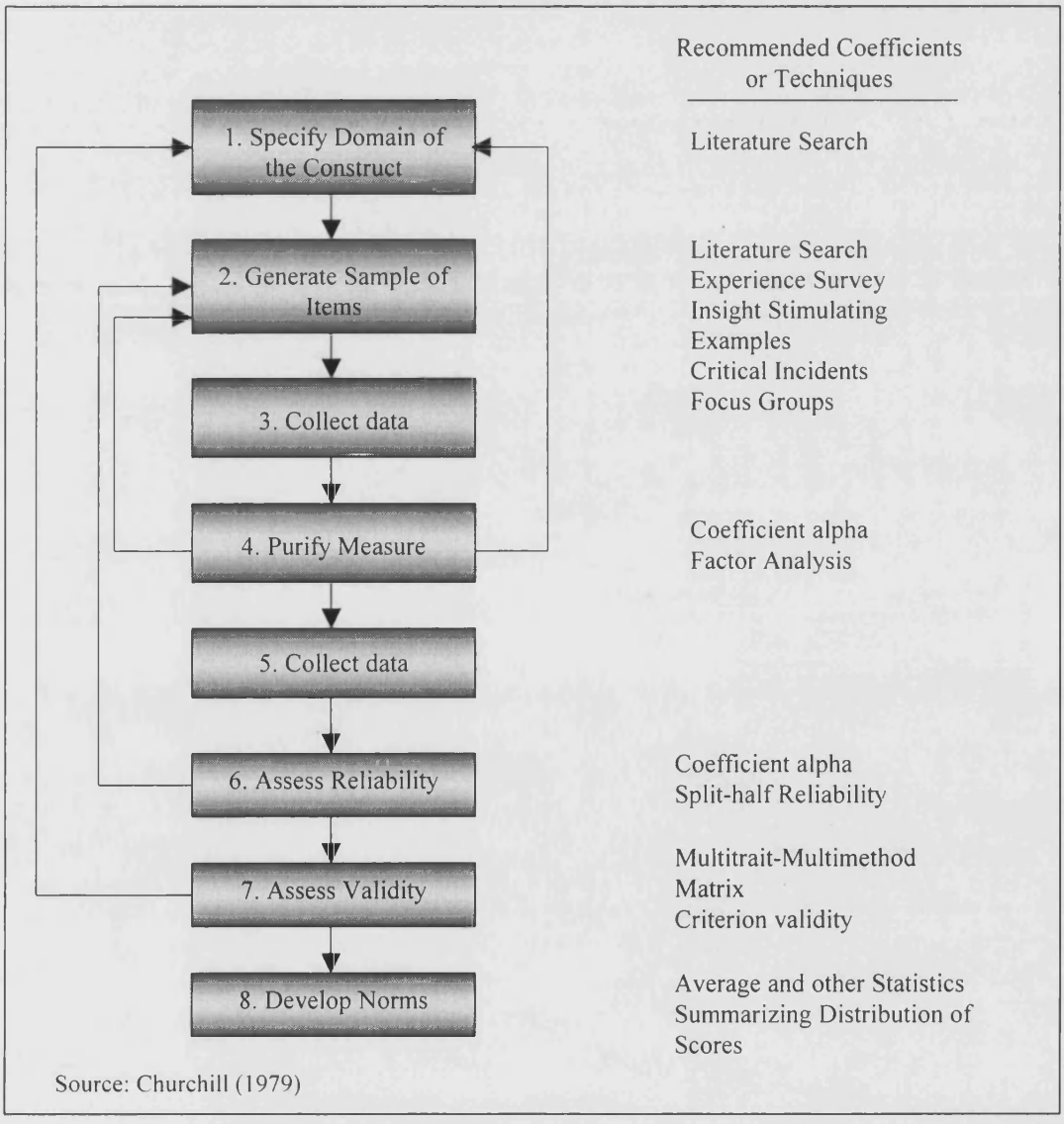
For the five new scales, items were generated from the literature and an experience survey[3] with 5 middle-level managers from a large multinational company. Subsequently, data were collected for a pre-test from 33 MBA students in June 1999 and the measures were purified by calculating their factor structures and the alpha coefficient of each new scale (e.g. Churchill 1979). The pre-test questionnaire can be found in Appendix I.1 and the factor and reliability analysis results are in Appendix I.2. The measures were then revised and additional items were generated where necessary.

[3] According to Churchill (1979: 67), "The experience survey is not a probability survey but a judgment sample of persons who can offer some ideas and insights into the phenomenon".

The full version of the questionnaire was subsequently drafted including the new and the literature adapted scales. Data were then collected in a pilot study using 35 MBAs in November 1999 and the measures were submitted to further exploratory factor analysis and alpha coefficient calculation. The results of this analysis are presented in Appendix II.2. The last stage in the process involved collecting data from the mail survey, which led to the assessment of all the measures' validity and reliability.

The process of operationalizing the constructs in the model and the source of each item are explained in the following sections. The full version of the pilot questionnaire can be found in Appendix II.1 and the survey questionnaire in Appendix III.2.

FIGURE 4.2: SUGGESTED PROCEDURE FOR DEVELOPING BETTER MEASURES



Source: Churchill (1979)

4.3.4 Operationalization of Constructs – New Scales

➢ **Organizational Memory**

According to Moorman and Miner (1997), organizational memory is defined as "*collective beliefs, behavioral routines, or physical artefacts that vary in their content, level, dispersion and accessibility*"(p.92). Content refers to the nature of the procedural and declarative memory in the organization; level refers to the amount of stored information and experience that an organization has about a particular phenomenon; dispersion refers to the degree to which memory is widely shared in the organization; and accessibility refers to the extent to which memory can be retrieved for use. So far in the marketing literature, two studies have attempted to measure memory: Moorman and Miner (1997) developed scales for measuring memory level and dispersion and Hult and Ferrell (1997) developed a scale for organizational learning that includes a dimension called "memory orientation", which also measures memory dispersion. Of the two dispersion scales, the Hult and Ferrell (1997) scale seemed more appropriate, mainly because Moorman and Miner's (1997) scale measured knowledge diversity and could potentially be confused with interpretive diversity - as suggested by an inspection of the scale items.

Given that scales already existed for two of the four memory characteristics, i.e., level and dispersion, it was necessary to generate items for memory accessibility and content. With reference to accessibility, O'Reilly (1982) has developed a scale to measure accessibility of information contained in internal and external organizational sources. It was therefore decided to adapt his three items to reflect memory accessibility. With reference to the two content dimensions, i.e., what is contained in terms of procedural and declarative knowledge, developing a scale to capture what an organization *knows* would clearly be impossible. However, it would be possible to link level of memory to content of memory, in other words to ask questions about the level of procedural and declarative memory in the organization. The list of items generated for the memory dimensions are presented in the table below:

TABLE 4.1: ORGANIZATIONAL MEMORY ITEMS

Items	Source
Level of Procedural Memory	**Adapted from:**
1. There was a great deal of experience in the organization concerning similar decisions.	Moorman and Miner 1997
2. There was a great deal of familiarity with this kind of decision in the organization.	Moorman and Miner 1997
3. There already existed a great deal of skill in making and implementing similar decisions in the organization.	Item from definition o procedural memory
4. There was a lot of know-how regarding the process of making and carrying out this decision.	Item from definition o procedural memory
Level of Declarative Memory	
5. There was a considerable investment in research and new information collection for this decision. (R)	Moorman and Miner 1997
6. There was a great amount of existing knowledge relevant to this decision.	Moorman and Miner 1997
7. There was a lot of expertise in making and implementing similar decisions.	Item from definition o declarative memory
Memory Dispersion	
8. There were specific mechanisms for sharing lessons learned during the decision making process.	Hult and Ferrell 1997
9. There was auditing of past unsuccessful endeavours and communication of relevant experience among decision makers.	Hult and Ferrell 1997
10. There was a good deal of conversation that kept alive the lessons learned from history.	Hult and Ferrell 1997
11. There were formal routines used to uncover faulty assumptions that may have been made about the decision making process.	Hult and Ferrell 1997
12. Existing knowledge was widely shared among decision makers.	Hult and Ferrell 1997
Memory Accessibility	
13. Stored knowledge and experience were easily accessible during the decision making process.	O'Reilly 1982
14. Although relevant knowledge and skills to making and implementing this decision existed in the organization, it was difficult to obtain them.	O'Reilly 1982
15. It was easy to retrieve existing knowledge relevant to the decision making process.	O'Reilly 1982

After collecting the data, the items were submitted to an exploratory factor analysis and a reliability analysis. The results are reported in Appendix I.2. Five factors were extracted from the analysis, i.e., one factor for memory accessibility, one factor for procedural and declarative memory, and a very unclear structure for memory dispersion.

Moreover, although the overall alpha coefficient was above Nunally's (1978) .7 threshold, at .78, the low inter-item correlations for all the memory dispersion items indicated that this dimension would have to be dropped (e.g. Hair, Anderson, Tatham, and Black 1998). In addition to the dispersion items, the reversed-score item no. 5 loaded negatively and had also to be dropped.

Based on the analysis, a decision needed to be made regarding the definition and dimensionality of the organizational memory construct for the measurement purposes of this study. The main operationalization problem with the memory level and accessibility characteristics was that although memory level could be defined along the two dimensions of memory content, i.e., procedural and declarative, it was difficult to do so for accessibility. Generating items for measuring accessibility of procedural memory is problematic, because the skills for performing tasks are often too tacit to be explicitly described (e.g. Moorman and Miner 1997). It was, therefore, decided to further explore only one aspect of the declarative and procedural dimensions of memory, i.e., level. Given that the six items representing level of memory had a standardized alpha at .87, they were considered suitable for representing the memory level construct.

The six items were subsequently revised for consistency in wording and precision in relation to the procedural and declarative memory definitions (Table 4.2). The question asked in the questionnaire was: "*Prior to initiating the decision making process and before acquiring any new information for this decision, compared to other firms in your industry, please indicate the extent to which in your organization...*" which is adapted from Moorman and Miner (1997).

TABLE 4.2: ORGANIZATIONAL MEMORY LEVEL ITEMS

Items	Source
1. There already existed a great deal of experience concerning similar decisions.	Moorman and Miner 1997
2. There already existed a great deal of familiarity with this kind of decision.	Moorman and Miner 1997
3. There already existed a great deal of expertise in dealing with such projects.	Item from definition o procedural memory
4. There already existed a great deal of stored knowledge and know-how pertaining to this decision.	Revised Item.
5. There already existed a significant amount of information about the issues surrounding the decision.	Revised item.
6. There already existed a great deal of skill in making and carrying out similar decisions.	Item from definition o procedural memory

➢ **Interpretive Diversity**

Interpretive diversity is defined as the extent to which members of a decision-making team agree or disagree about the content and framing of market information. Content refers to *what is* expressed in the collected market information, while framing refers to the cognitive frames of reference used to evaluate the market information. Before attempting to measure diversity, it was necessary to develop items that would adequately describe interpretive content and frame.

As far as interpretive content is concerned, with the exception of studies that operationalize the content of strategic issues as controllable vs. uncontrollable; opportunity vs. threat (e.g. Thomas et al. 1993; Denisson et al. 1996), etc., and studies that employ an observation or experimental methodology to study the content of interpretations, there is very limited literature that can be drawn upon to develop a measure of content of market information. However, since the ultimate objective was to measure diversity of content, rather than content *per se*, it was decided to explore the construct of information equivocality, which is conceptually close to interpretive diversity, with a view to adapting it for the purposes of this study. Information equivocality has been defined as "*the multiplicity of meaning conveyed by information about organizational activities*" (Daft and Macintosh 1981: 211). Equivocality is seen as an information attribute, as it refers to "*information that lends itself to different and perhaps conflicting interpretations about the work context*" (Daft and Macintosh 1981: 211). Interpretive diversity of content is similar to equivocality in that it also concerns multiplicity of meanings. However, unlike equivocality, it refers to the extent of divergence among interpretations, rather than the level of implicit ambiguity of the information. Obviously the two constructs are related in that the more equivocal the information, the more likely are people to interpret it differently. In this sense, equivocality of information provides a useful starting point for developing an interpretive diversity scale. The items developed for interpretive content aimed to describe information attributes concerning multiplicity and ambiguity of meanings and are presented in the table below:

TABLE 4.3: INTERPRETIVE CONTENT ITEMS

Items	Source Adapted from:
1. The meaning of the information was unclear.	Shrivastava 1987
2. The information conveyed conflicting signals.	Experience Survey
3. The information contained many contradictory statements and findings	Desphandé and Zaltman 1982
4. I found the information complex to analyze.	Desphandé and Zaltman 1982
5. I found the information difficult to understand.	Shrivastava 1987
6. The information was inconclusive.	Desphandé and Zaltman 1982
7. The information could be interpreted in many different ways.	Daft and Macintosh 1981
8. The information lead to more than one solution.	Daft and Macintosh 1981
9. The information meant different things to different people.	Daft and Macintosh 1981

The factor analysis revealed one clear factor comprised by items 2, 3, 7, 8, and 9, which clearly represent equivocality of information and have an alpha coefficient of .91. These items were subsequently revised to questions aiming to capture the extent of diversity among decision-makers (e.g. Miller et al. 1998) with regard to the content of market information. In addition to the items representing interpretive content, which resulted from the first stage of data collection in the scale development process, additional items with slightly different shades of meaning were developed, to provide a better foundation for the eventual measure (Churchill 1979). These items are adapted from conceptually similar studies on cognitive conflict (Amason 1996), conceptual utilization of information (Moorman 1995), dissent (Dooley and Fryxell 1999), and comprehensiveness (Fredrickson 1984). The items are presented in Table 4.4 below. Respondents were asked to reply to the following question: "*During the process of analyzing information about the market, decision-makers are likely to interpret the information in different ways, bringing their own different perspectives to the situation. In the process of making the decision you described in Section I, to what extent...*"

TABLE 4.4: INTERPRETIVE DIVERSITY OF CONTENT ITEMS

Items	Source Adapted from:
1. Did decision-makers challenge each other's opinions of what the information meant?	Moorman 1995
2. Were different opinions about the implications of the information expressed among decision-makers?	Daft and Macintosh 1981
3. Did the collected information sometimes mean different things to different people?	Daft and Macintosh 1987
4. Were there disagreements over different ideas about the content of the information?	Amason 1996
5. Was the information analyzed from many different perspectives?	Fredrickson 1981
6. Were there differences in the interpretation of the market information among decision-makers?	New Item
7. Did decision-makers voice dissent while analyzing the information?	Dooley and Fryxell 1999
8. Were different solutions produced as a result of the different understanding of the information among decision-makers?	Daft and Macintosh 1981
9. Was information interpreted in different ways by the decision-makers?	New Item

With reference to information framing, there are a number of studies suggesting that the frames of reference managers use to assess information can be broadly categorized into the two dimensions of perceived quality and perceived usefulness of market information (e.g. Menon and Vardarajan 1992; Weiss and Bucuvalas 1980). Items for these two frame categories are widely available in the literature (e.g. Desphandé and Zaltman 1982; John and Martin 1984; Shrivastava 1987) and it was decided that before attempting to measure frame diversity, to first test the items for dimensionality in the main pilot study. The items are presented in the table below:

TABLE 4.5: INTERPRETIVE FRAME ITEMS

Items	Source Adapted from:
Quality of Information	
1. The information was accurate.	John and Martin 1984
2. The information was specific and to the point.	John and Martin 1984
3. The information was realistic.	John and Martin 1984
4. The information was available on time.	O'Reilly 1982
5. The information was current and topical.	Maltz and Kohli 1996
6. The information was out of date. (R)	Maltz and Kohli 1996
7. The information was based on valid assumptions.	John and Martin 1984
8. The technical quality of the information was high.	Desphandé and Zaltman 198
9. The information accurately reflected market conditions.	Maltz and Kohli 1996
10. The information was internally consistent and valid.	John and Martin 1984
11. I was unsure whether to trust the information. (R)	O'Reilly 1982
12. I felt I could rely on the information.	O'Reilly 1982
13. The information was questionable. (R)	O'Reilly 1982
Usefulness of Information	
14. The information was meaningful.	Shrivastava 1987
15. The information was clear and understandable.	Maltz and Kohli 1996
16. The information made sense.	Maltz and Kohli 1996
17. The information was logical and coherent.	Maltz and Kohli 1996
18. The information raised new issues/perspectives.	Shrivastava 1987
19. The information provided innovative insights into the issues at hand.	Shrivastava 1987
20. The information challenged existing assumptions.	Desphandé and Zaltman 198
21. The information provided non-obvious insights into the issues at hand.	Weiss and Bucuvalas 1980
22. The information contained elements of surprise.	Desphandé and Zaltman 198
23. The information was suitable to address the issues relating to the decision.	O'Reilly 1982
24. The information was relevant to the decision.	Maltz and Kohli 1996
25. The information was rather inappropriate for the decision. (R)	Maltz and Kohli 1996
26. The information matched very well our intelligence needs for this decision.	Shrivastava 1987
27. The information adequately addressed the problems we had to solve.	Shrivastava 1987
28. The information had clear action implications.	Desphandé and Zaltman 198
29. The information provided explicit recommendations pertaining to the decision.	Desphandé and Zaltman 198
30. The information suggested recommendations that could be easily put into effect.	Desphandé and Zaltman 198
31. The information suggested feasible implications in terms of costs.	Desphandé and Zaltman 198
32. The information suggested feasible implications in terms of time.	Desphandé and Zaltman 198

The results of the factor analysis and the alpha scores are presented in Appendix II.2. The results confirm the factor structures suggested by Menon and Varadarajan (1992). Quality of information is represented by credibility (John and Martin 1984), timeliness (e.g. Maltz and Kohli 1996; O'Reilly 1982), and reliability (e.g. Maltz and Kohli 1996; Desphandé and Zaltman 1982; O'Reilly 1982). Accordingly the dimensions of information usefulness proposed by Shrivastava (1987) and Thomas and Tymon (1982), are also confirmed as meaningfulness/clarity, relevance, applicability, and innovativeness.

Based on the above, the scale for interpretive frame diversity was constructed for the main survey questionnaire. Because the items were too many and of a very subjective nature for one key informant to accurately respond for the whole team, it was decided that (1) summary items assessing each dimension would be included and (2) that key informants would be asked whether there were *expressed* disagreements during the decision-making process concerning the quality and usefulness of market information. The scale is presented in Table 4.6 below:

TABLE 4.6: INTERPRETIVE DIVERSITY OF FRAME ITEMS

Items
1. Did decision-makers *disagree* about the overall credibility of the information?
2. Did decision-makers *disagree* about the reliability of the information?
3. Did decision-makers *disagree* about the timeliness of the information?
4. Did decision-makers *disagree* about the relevance of the information for the decision at hand?
5. Did decision-makers *disagree* about the clarity of the information?
6. Did decision-makers *disagree* about the applicability of the information?
7. Did decision-makers *disagree* about the innovativeness of the information?

- **Adaptation**

Adaptation has been defined as "*the deliberate change in organizational actions by decision makers in response to changed organization-environment conditions*" (Duncan and Weiss 1979: 81). Because adaptation is about deliberate purposeful change in organizational actions, it should be pointed out that for such changes to occur, a certain level of cognitive change in the top managers' mental models is first required (Barr et al. 1992). In other words, cognition is closely linked to managerial actions (strategic decisions), while change in managerial actions can be inferred from the extent to which

cognition alters in response to incoming information about the organization's environment. Hence, in this study adaptation is represented by the level of change in managerial cognition as reflected in the active utilization of incoming market information during the strategic decision-making process.

For measurement purposes, the scale of adaptation aims to assess the extent to which the utilization of acquired market information caused changes in the way that decision-makers thought about the decision. Before attempting to measure change in cognition, it was necessary to develop items to capture instrumental utilization of information during the decision-making process. Instrumental utilization of information refers to the direct application of information to make a particular decision (Desphandé and Zaltman 1982). The items that were tested in the first pre-test are presented in Table 4.7 below:

TABLE 4.7: INSTRUMENTAL USE OF INFORMATION ITEMS

Items	Source Adapted from:
1. The information was suitable to the problem.	Feldman and March 1981
2. The information enriched my understanding about the decision.	Desphandé and Zaltman 198
3. No decision would have been made without the collected information.	Desphandé and Zaltman 198
4. The way I thought about the decision would have been very different without the collected information.	Desphandé and Zaltman 198
5. Information was helpful in resolving key issues of this decision.	Moorman 1995
6. The information added significantly to my knowledge.	Knorr 1977
7. The information was very appropriate to my needs.	Experience Survey
8. The information was exactly what I required.	Experience Survey
9. The information helped shape this decision.	Moorman 1995
10. The information reduced my uncertainty about the decision	Desphandé and Zaltman 198
11. The information improved implementation of this decision.	Maltz and Kohli 1996
12. We relied on the information to make and implement this decision.	Moorman 1995
13. The information helped me identify aspects of the decision that I did not consider before.	Experience Survey
14. The information provided distinct directions and led to concrete actions.	Moorman 1995
15. The ability to implement this decision would have been diminished without the information.	Maltz and Kohli 1996

Four factors were extracted from the analysis (Appendix I.2). Items1, 2, 4, 5, 6, 13, 14, and 15 comprise the first factor, which represents instrumental utilization of information during the decision-making process. The second factor, i.e., items 4, 7, and 8 represent information usefulness and was decided to be excluded from the adaptation scale, as usefulness is one of the interpretive frame dimensions. The eight items that make up the instrumental utilization scale have an alpha score of .92.

Given that the end objective was to measure adaptation as the extent of cognitive change during the decision-making process in response to the instrumental utilization of market information, the 8 items were further modified to reflect change in cognition during the phases of decision-making. According to Mintzberg et al. (1976), strategic decision-making involves three major phases: (1) the identification phase, which refers to the recognition of problems, opportunities, and/or crises that evoke decisional activity; (2) the development phase, which refers to the generation of alternatives or modification of solutions; and (3) the selection phase which involves choosing amongst alternatives and committing the organization to a course of action. Hence, a first issue was that the three stages in strategic decision-making should be represented in the adaptation scale.

In order to measure change in cognition the Schweiger et al. (1986) items for measuring re-evaluation were used. Specifically, the authors measured re-evaluation by assessing the extent to which members of a decision-making team (1) re-evaluated their assumptions and recommendations as a result of the group decision-making processes and (2) uncovered assumptions and recommendations that were not considered before. Accordingly, the items for instrumental utilization were adapted to reflect change in cognition as a result of group information processing, during the three decision-making phases. The items are presented in Table 4.8 below.

Managers were asked to respond to the following question: "*Because during decision-making different people bring their own different perspectives to the situation, utilization of market information by a group of decision-makers can sometimes result in changes in the way of thinking about the decision. Thinking about the way in which the group process of analyzing and interpreting the collected information influenced this decision, please indicate the extent to which each statement describes the situation.*"

TABLE 4.8: ADAPTATION ITEMS

Items	Source Adapted from:
Identification Phase	
1. The group information analysis process revealed opportunities/problems that were not considered before.	Item 13 in pre-test
2. The group information analysis process motivated me to re-examine my own personal assumptions about the situation.	Schweiger et al. 1986
Development Phase	
3. The group information analysis process helped produce a wider range of alternatives for this decision.	Schweiger et al. 1986
4. The group information analysis process uncovered ideas about this decision that I did not consider before.	Item 4 in pre-test
5. The group information analysis process prompted me to critically re-evaluate my own recommendations for this decision.	Schweiger et al. 1986
Selection Phase	
6. The group information analysis process provided novel insight in setting specific goals and objectives for this decision.	Item 5 in pre-test
7. The group information analysis process provided distinct directions in selecting amongst alternative options.	Item 14 in pre-test
8. The group information analysis process resulted in selecting a course of action that originated from synergy rather than my own individual analysis.	Schweiger et al 1986

➢ **Decision Quality**

According to Amason (1996) measurement of decision quality requires the use of a perceptual measure of relative quality. This is because decisions that are good in one context may produce poor results in a different context. Moreover, using objective measures to evaluate different decisions implies that each decision has an equal chance of producing favorable outcomes. However, since decisions are bound by the choice of alternatives that decision-makers have at their disposal, an objective measure could be misleading. "*Thus, the best way to gauge the quality of an individual strategic decision is to ask those who have observed its effects and who understand its context to judge retrospectively and on several dimensions, how the decision turned out*" (Amason 1996: 134).

Based on the above, the next issue was to generate dimensions that would capture decision quality. Twenty-four items describing quality were generated from the literature on global quality dimensions relating to strategy (e.g. Menon et al. 1996; John and Martin 1984), Amason's (1996) scale for decision quality, the recommendations of

Schweiger et al. (1986) and Nutt (1998) for assessing strategic decision quality, and the experience survey with the managers. The generated items are presented in the table below:

TABLE 4.9: DECISION QUALITY ITEMS

Items	Source Adapted from:
1. The decision achieved the intended results.	Amason 1996
2. The decision was sound.	Schweiger et al. 1986
3. The decision added significant value to the organization.	Nutt 1998
4. This was a high quality decision.	Amason 1996
5. The decision was appropriate given the organization's situation.	John and Martin 1984
6. The decision was current and topical.	John and Martin 1984
7. The decision was made and implemented in a timely manner.	Nutt 1998
8. The decision was well timed.	Nutt 1998
9. It took too much time to implement the decision.	Nutt 1998
10. The decision was consistent with the overall strategy.	Schweiger et al. 1986
11. The decision appropriately addressed the problems facing the organization.	Experience Survey
12. The decision was well aligned with the objectives of the organization.	Experience Survey
13. The decision was part of the marketing plan.	John and Martin 1984
14. The decision was compatible with the mission of the organization.	Experience Survey
15. The decision was completely adapted	Nutt 1998
16. The decision threatened existing arrangements.	New Item
17. The decision threatened existing assumptions.	New Item
18. The decision was fully operationalized.	Nutt 1998
19. Implementation of the decision was unsuccessful.	Menon et al. 1996
20. The decision was widely supported.	Experience survey
21. The implications of the decision were acceptable to everyone affected by the decision.	Experience Survey
22. The decision was widely approved.	New Item
23. The decision was successfully implemented.	Menon et al. 1996
24. The decision was widely acceptable.	Schweiger et al. 1986

Factor analysis extracted five factors, the strongest factor accounting for 45% of the variance. The first factor is comprised by items 1, 2, 3, 4, 5, 6, 7, 10, 11, 12, 20, 21, 23 and represents decision quality. The alpha score for the thirteen items is .96. Twelve of the thirteen items were subsequently further reviewed for precision in wording and formed the decision quality scale presented in Table 4.10 below. (Item 23 was dropped

as reliability of the scale improves when the item is deleted). Moreover, the items were also compared against the scale for decision quality published in August 1999 by Dooley and Fryxell, after the completion of the first pretest. The six items of the Dooley and Fryxell (1999) scale were adequately covered in the new scale. Managers were asked to respond to the following question: "*With reference to the overall quality of this decision, please indicate the extent to which you agree or disagree with the following statements...*"

TABLE 4.10: DECISION QUALITY ITEMS

Items
1. The decision fully achieved the intended results.
2. The decision was based on valid assumptions.
3. The decision made sense in light of the organization's market position.
4. The decision was current and topical.
5. The decision was made and implemented in a timely manner.
6. The decision significantly contributed to the effectiveness of the organizaton.
7. The decision was consistent with the overall strategy.
8. The decision effectively addressed the problems that the organization was facing.
9. The decision was consistent with the objectives of the organization.
10. The implications of the decision were acceptable to everyone affected by the decision.
11. The decision was widely supported in the organization.
12. This was a high quality decision.

- **Decision Creativity**

Decision creativity is defined as the extent to which the decision is novel for the organization and its implementation changes marketing thinking and practice (e.g. Andrews and Smith 1996; Moorman 1995; Wilton and Meyers 1986). This definition, which is based on work on marketing strategy making (Menon et al. 1999) marketing program creativity (Andrews and Smith 1996) and new product creativity (Moorman 1995), has two components: First, that decisions are novel, i.e., they deviate from past organizational practice, and second, that they introduce change, i.e., they could set a trend for the organization and/or the industry. The items were adopted from the literature on creativity of strategy and new product creativity and are presented in the table below:

TABLE 4.11: DECISION CREATIVITY ITEMS

Items	Source Adapted From:
1. The decision included new aspects compared to previous decisions in the organization.	Menon et al. 1999
2. The decision was very different from others developed in the past in the organization.	Menon et al. 1999
3. The decision broke some of the "rules of the game" within the market.	Menon et al. 1999
4. The decision broke some of the "rules of the game" within the company.	Menon et al. 1999
5. This decision was innovative.	Menon et al. 1999
6. Compared to previous, similar decisions, at least some parts were daring, risky, or bold.	Menon et al. 1999
7. The decision was very novel for the organization.	Andrews and Smith 1996
8. The decision offered new ideas to the organization.	Moorman 1995
9. The decision was creative.	Moorman 1995
10. The decision was uninteresting.	Experience Survey
11. The decision spawned ideas for other/new strategies.	Moorman 1995
12. The decision encouraged fresh thinking.	Moorman 1995
13. The decision was inspiring.	Experience Survey
14. The decision involved lateral thinking.	Experience Survey

Three factors were extracted from the analysis, the first of which is comprised of items 1, 2, 3, 4, 5, 7, 9, and 14 and accounts for 49% of the variance. The alpha score for the scale is .90. (Appendix I.2) The seven items were further refined and some were slightly modified for precision in wording. The scale is presented in Table 4.12. Respondents were asked to reply to the following question: "*In evaluating the creativity of this decision, please indicate the extent to which you agree or disagree with the following statements...*"

TABLE 4.12: DECISION CREATIVITY ITEMS

Items
1. The decision included new aspects compared to previous decisions in the organization.
2. The decision was very different from others developed in the past in the organization.
3. The decision broke some of the "rules of the game" within the market.
4. The decision broke some of the "rules of the game" within the company.
5. This decision was innovative.
6. The decision was very novel for the organization.
7. The decision was creative.
8. The decision involved lateral thinking.

4.3.5 Operationalization of Constructs – Adapted Scales

➢ **Centralization of Structure**

The scale for centralization was developed to reflect the Desphandé and Kohli (1989) definition, as the degree of participation by organizational members in decision-making and the extent of delegation of decision-making authority. The items were adapted from the marketing and management literature on centralization of structure in the context of information-processing (Thomas et al. 1990, 1994; Hurley and Hult 1998) and marketing strategy making (Menon et al. 1999) and are presented in Table 4.13 below:

TABLE 4.13: CENTRALIZATION ITEMS

Items	Source:
1. Can the process of making strategic decisions be characterized as participative?	Thomas et al. 1994
2. Do one or two people dominate the handling of strategic issues with the organization?	Thomas et al. 1994
3. Are views other than those of the top management included in the strategic decision processes?	Thomas et al. 1994
4. Is there a free and open exchange of ideas among those participating in a given decision?	Thomas et al. 1994
5. Do people affected by a decision typically feel that the definition of the issue(s) and/or the manner in which it was resolved was imposed upon them?	Thomas et al. 1994
6. Does strategic decision-making tend to be made only at senior management levels?	Menon et al. 1999
7. Are people allowed to make decisions in matters concerning their work?	Menon et al. 1999
8. Do top managers make decisions without consulting with anyone else?	Menon et al. 1999
9. Is authority highly centralized?	New Item

➢ **Formalization of Structure**

The formalization scale was adapted from the Thomas et al. (1994), Menon et al. (1999) and Moorman et al. (1993) research to measure the degree to which rules, procedures, and roles to accomplish tasks are explicitly specified by the organization. The scale is presented below:

TABLE 4.14: FORMALIZATION ITEMS

Items	Source:
1. Are written rules and procedures followed when decisions are addressed?	Thomas et al. 1994
2. Do people make their own rules on the job?	Thomas et al. 1994
3. Can decision-making be characterized as a process dominated by formal rules and procedures?	Thomas et al. 1994
4. Is there a standard operating procedure for major decisions?	Menon et al. 1999
5. Must plans be rigidly followed throughout the decision-making process?	Menon et al. 1999
6. Is the way to carry out activities left up to the person doing the work?	Moorman et al. 199

➢ **Innovative Culture**

The innovative culture scale was developed to reflect (1) Menon et al.'s (1999) definition of innovative culture as the degree to which the organization emphasizes innovation, dynamism, openness, and change, (2) Sinkula et al.'s (1997) notion of learning orientation as the organizational values that influence the propensity of the firm to create and use knowledge, and (3) Hurley and Hult's (1998) innovativeness construct. The items are presented in Table 4.15 below:

TABLE 4.15: INNOVATIVE CULTURE ITEMS

Items	Source:
1. Our organization is dynamic and entrepreneurial.	Menon et al. 1999
2. There is strong emphasis on innovation and change.	Menon et al. 1999
3. The management of this organization actively seeks innovative ideas.	Hurley and Hult 1998
4. People in this organization feel that others listen to their ideas.	Menon et al. 1999
5. There is commitment to continuous innovation and improvement.	Hurley and Hult 1998
6. Management is always willing to consider and adopt new ideas.	Hurley and Hult 1998
7. There is an eagerness to take risks.	Hurley and Hult 1998
8. In this organization learning is seen as a key to improvement.	Sinkula et al. 1997
9. Learning and innovation in the organization are seen as key to sustaining competitive advantage.	Sinkula et al. 1997
10. There is a general feeling of trust and confidence between different groups.	Menon et al. 1999
11. Employees view themselves as partners in charting the direction of the organization.	Sinkula et al. 1997
12. There is a commonality of purpose in this organization.	Sinkula et al. 1997

➢ **Interdepartmental Integration**

Interdepartmental integration is defined as a two-dimensional construct representing the level of interaction and collaboration between the functional departments of the organization. The interaction scale was developed to reflect the nature, i.e., quality, and extent of communications between departments. The items are adapted from Menon et al.'s (1999) quality of communications scale and Thomas et al.'s (1990) level of interaction items. The collaboration scale represents the unstructured, affective nature of interdepartmental relationships and is based on Kahn's (1996) collaboration scale and Maltz and Kohli's (1996) interfunctional rivalry scale. The scales are presented in table 4.16 below:

TABLE 4.16: INTERDEPARTMENTAL INTEGRATION ITEMS

Items	Source:
Interaction Items	
1. Did the key people involved in this decision interact on an ongoing basis during the decision-making process?	Menon et al. 1999
2. Did individuals in the decision-making group interact with each other on an informal basis?	Thomas et al. 1990
3. Were task groups formed to deal with strategic issues arising during this decision?	Thomas et al. 1990
4. Can the process of making this decision be characterized as interactive?	Thomas et al. 1990
5. Was there a free and open exchange of ideas among decision-makers about strategic issues?	Thomas et al. 1990
6. Were there extensive formal and informal communications during decision-making?	Menon et al. 1999
7. Were the decision's objectives and goals communicated clearly to all the involved and concerned parties?	Menon et al. 1999
Collaboration Items	
1. Did your department achieve goals collectively with other departments?	Kahn 1996
2. Did members of your department informally work together with people from other departments?	Kahn 1996
3. Did your department share ideas, information, and/or resources with other departments?	Kahn 1996
4. Did people from different departments work together as a team?	Kahn 1996
5. Did you experience problems coordinating work activities between the different departments?	Maltz and Kohli 1996
6. Was there agreement on the priorities of each department?	Maltz and Kohli 1996
7. Did your department compete for the same resources with other departments?	Maltz and Kohli 1996
8. Were there senior managers from different departments "at odds" over elements of this decision?	Maltz and Kohli 1996

➢ **Political Behavior**

The scale was developed to reflect Dean and Sharfman's (1996) definition of political behavior in strategic-decision making as intentional acts of influence to enhance or protect the self-interests of individuals or groups. The items were adapted from the Dean and Sharfman (1996) scale and the Thomas et al. (1994) scale of political activity.

TABLE 4.17: POLITICAL BEHAVIOR ITEMS

Items	Source:
1. Were people open with each other about their own interests and preferences in the decision?	Dean and Sharfman 1996
2. Were decision-makers primarily concerned with their own goals rather than with the goals of the organization?	Dean and Sharfman 1996
3. Was the decision affected by the use of power and influence among decision-makers?	Dean and Sharfman 1996
4. Was the decision affected by bargaining among decision-makers?	Dean and Sharfman 1996
5. Can decision-making be characterized as the "give and take" of different interests and factions?	Thomas et al. 1994
6. Did decision-makers join forces or form alliances with other people or departments to "push through" their points of view?	Thomas et al. 1994

➢ **Scanning**

Scanning refers to the process of bringing information about the market across the boundary of the organization. The scale used to measure scanning processes reflects the amount and breadth of information acquired for the particular decision (e.g. Moorman 1995; Jaworski and Kohli 1993). Amount relates to *how much* information was acquired for the decision, while breadth relates to *how many* domains the information covers (i.e., customers, competitors, industry, etc). The items are presented in table 4.18 below:

TABLE 4.18: SCANNING ITEMS

Items	Source:
1. We made a significant investment in market research and the collection of new information.	Moorman and Miner 1997
2. We acquired sufficient information to address the issues arising during this decision.	Herbig and Kramer (1994)
3. We collected all possible information before making the decision.	Daft and Macintosh 1981
4. We needed more information to deal with the issues arising during the decision (R).	New Item
5. Intelligence collected on our competitors was comprehensive.	Li and Calantone 1998
6. We collected extensive information on our customers' needs.	Moorman 1995
7. We systematically reviewed the conditions in our business environment that may have impacted this decision (e.g. competition, technology, regulation).	Jaworski and Kohli 1993
8. We collected industry information to detect any fundamental shifts.	Jaworski and Kohli 1993
9. We collected information from people who can influence our end users' purchase behaviour (e.g. retailers, distributors).	Jaworski and Kohli 1993

- **Decision Performance**

Decision performance was measured with a scale that captured the extent to which the decision met expectations for overall performance, success, net profits, and sales. The scale is adapted from the Menon et al. (1999) study for assessing the market performance of a marketing strategy.

TABLE 4.19: DECISION PERFORMANCE ITEMS

Items	Source:
1. Overall decision performance compared to expectations.	Menon et al. 1999
2. Overall decision success.	Menon et al. 1999
3. Positive effect on organizational performance.	Amason 1996
4. Net profits relative to expectations	Menon et al. 1999
5. Sales relative to expectations	Menon et al. 1999

- **Decision Complexity**

Decision complexity is seen as the degree of decision difficulty and decision variability inherent in the decision. Decision difficulty refers to the degree to which the work is analyzable and its outcome predicted (Menon and Varadarajan 1992). Decision

variability concerns the extent of exceptions that were encountered in performing the task (Van De Ven and Ferry 1980). The scales were adapted from the construct of task complexity in the research of Van De Ven and Ferry (1980) and Daft and Macintosh (1981).

TABLE 4.20: DECISION COMPLEXITY ITEMS

Items	Source:
Decision Difficulty	
1. The way to carry out the major activities involved in this decision was clear.	Van De Ven and Ferry 1980
2. We were fairly certain of what the outcomes of the decision would be.	Van De Ven and Ferry 1980
3. Difficult problems would arise during this decision, for which there were no apparent or immediate solutions.	Van De Ven and Ferry 1980
4. For this decision we relied on established procedures and practices.	Daft and Macintosh 1981
5. We had to spend a lot of time solving problems encountered during this decision.	Van De Ven and Ferry 1980
Decision Variability	
6. The problems or issues we encountered in this decision were similar to those encountered in previous decisions.	Van De Ven and Ferry 1980
7. The process of making and implementing this decision could be described as routine.	Daft and Macintosh 1981
8. It took a lot of training and experience to deal with the problems encountered in this decision.	Daft and Macintosh 1981
9. The problems encountered in this decision required extensive and demanding solutions.	Daft and Macintosh 1981
10. The same work methods or steps were followed to resolve issues or problems in this decision as in previous decisions.	Van De Ven and Ferry 1980
11. Overall this was a highly complex decision.	New Item

- **Environmental Turbulence**

Jaworski and Kohli's (1993) measures of market turbulence, competitive intensity, and technological turbulence were employed to measure environmental turbulence. The items can be found in the pilot questionnaire in Appendix II.1.

- **Information Equivocality**

A three item-measure of information equivocality was included in the main survey questionnaire in order to test for convergent validity with the interpretive diversity scale.

The scale was adapted from Daft and Macintosh (1981) and is presented in the questionnaire in Appendix II.1.

4.3.6 Form of Response

According to Churchill (1995), once the content of the individual questions is determined, the researcher needs to decide on the form of response. Generally questions can be classified as open-ended or fixed alternative, while fixed alternative questions can be multichotomies, dichotomies, or scales (Churchill 1995).

Open-ended questions were not considered appropriate, given that they take a lot of time for respondents to answer and that entail higher costs, in terms of time and effort, for researchers to analyze and interpret meaningfully (Peterson 1988). Hence, given the sizeable amount of information sought in the study and following the standard practice in the literature, Likert type scales were used for all the questions. Scaled response forms are also considered the most appropriate form of question for measuring constructs that are not directly observable, but are latent variables that determine certain behavioral patterns reflected in the responses to relevant items (Burns and Bush 1995). Moreover, since most of the scales that were drawn from the literature were seven point scales, for purposes of consistency and simplicity all scales in the questionnaire had seven points, ranging from 1= strongly disagree/not at all to 7= strongly agree/ to a great extent.

4.3.7 Question Sequence

The introductory paragraph to the questionnaire assures respondents of their anonymity, gives brief directions concerning how it should be completed, and offers an estimate of the time it will take them to complete the survey. Five general sections were included in the questionnaire and were given the following formal headings:

- Decision Making
- Collecting and Analyzing Information for Decision Making
- Organizational Environment
- Industry Conditions
- Additional Information

Generally, questionnaires should flow smoothly and logically from one topic to the next and sudden shifts in topic ought to be avoided, as they tend to confuse respondents (Aaker and Day 1983). Hence, given that the level of analysis in this study is the strategic decision, the first question requires respondents to describe the most recent strategic marketing decision that was made in their organization. The rest of the first section deals with measurement of organizational memory, decision difficulty, and overall decision effectiveness. Organizational memory was placed before anything else so that respondents could easily go back to the time before the decision was made without "contaminating" their answers with thoughts of what happened during or after the decision-making process. Moreover, because the questions on interpretive diversity are about dissent and could be considered more sensitive, it was decided to place decision effectiveness questions (i.e., the facts), before assessment of the more subjective conditions that lead to the particular decision outcomes.

The most logical order was to ask questions regarding the learning process subsequently, as these are questions directly linked to the decision. Commonsense suggested that the questions in the second section would be placed in the most rational order of information acquisition preceding information interpretation, which is then followed by adaptation.

Next, questions regarding first the organizational environment and then the industrial environment in which the decision took place were asked. With reference to organizational environment, following the recommendations of Churchill (1995), care was taken to place the more sensitive political behavior scale last in the sequence. Last were placed the classification variables, which should be situated at the end of the research instrument (e.g. Churchill 1991).

4.3.8 Physical Characteristics

The physical characteristics of the research instrument can be crucial in two ways. First, the appearance of the questionnaire can be instrumental in securing the cooperation of the respondents (Luck and Rubin 1987). Second, the layout of the questionnaire can affect the accuracy of the replies that are obtained (Churchill 1995; Tull and Hawkins 1993). Based on this, the questionnaire was designed to appear both appealing and practical. The instrument was typed into a presentation package and printed in high-density paper by the University printing services.

The most important parameter in the physical design of the questionnaire was size. According to Jobber and Saunders (1993), business respondents in the UK are found to be more sensitive to questionnaire size compared to the general population. Thus, the pilot questionnaire consisted of 6 pages printed in a double-sided format, making the questionnaire appear shorter and, therefore, less time-consuming.

4.3.9 Pilot-testing the Questionnaire

A pretest test is considered vital to assess how the questionnaire performs under actual conditions of data collection (Churchill 1995). Hence, a pilot test was conducted in order to establish the appropriateness of the phrasing, the content, sequence, and the physical characteristics of the questionnaire (Oppenheim 1992). Following the recommendations of Kinnear and Taylor (1993), initial pre-testing of the questionnaire should be conducted via personal interviews, i.e., protocols, while final pre-testing should employ the medium used in the main study.

A protocol is a personal interview whereby the respondent is asked to evaluate the questionnaire as he/she answers the questions. Informal protocols were held with 3 managers. They were asked to complete the questionnaire and comment on any problems encountered, the phrasing and content of the questions, and the physical characteristics of the questionnaire. The main concerns expressed were that (1) the questionnaire was consistently found to be very long, (2) the types of questions, i.e., Likert type scales, were considered tiring and (3) some items were perceived to be overlapping.

Following the protocols, the questionnaire was distributed to 19 managers and 16 MBA's for completion in November 1999. The objective of the pilot test was to assess the content of the questions, with a view to purify the scales used to measure the constructs.

4.3.10 Questionnaire Revision

Based on the protocols and the survey with the managers and MBA's the questionnaire was further revised. All the scales were submitted to an exploratory factor analysis and calculation of the alpha coefficient. The results of the factor and reliability analysis for each construct are presented in Appendix II.2 Following the recommendations from the

protocols, regarding the length of the questionnaire and the subsequent statistical analysis of the data, from the 168 initial items, 53 items were dropped, leaving 115 items in the main survey questionnaire and reducing questionnaire size to a total of 4 pages. The revised questionnaire is presented in Appendix III.2. The amendments to the questionnaire are discussed briefly below:

4.3.10A Organizational Context Measures

- **Centralization**

Following the factor and reliability analysis results, six out of the original nine items were retained in the final scale. These are items 1, 3, 5, 6, 7, and 8, on the pilot questionnaire.

- **Formalization**

The first five items from the original six-item scale were retained in the survey questionnaire, given that the last item loaded on a separate factor.

- **Innovative Culture**

The factor analysis of innovative culture revealed one factor representing innovativeness (1, 2, 3, 5, 6, 7) and another factor broadly describing values of openness and shared vision (4, 6, 8, 9, 10, 11, 12). Based on this, only the factor representing innovativeness was included as a measure for innovative culture in the survey questionnaire.

- **Interdepartmental Integration**

With reference to the interaction dimension, item 3 in the original questionnaire loaded on a separate factor, and was therefore excluded from the scale. The other six items were retained.

With reference to the cooperation dimension, factor analysis extracted two different factors. The first factor comprised items 1to 5, while the second factor included the reversed score items and item 6. Based on this, only the first factor was maintained in the main survey questionnaire.

➢ **Political Behavior**

All six original items were retained in the survey questionnaire, although items 1 and 3 loaded on a different factor. The decision to keep them was because Cronbach's alpha did not improve with their deletion. Instead, it was decided to modify their wording. Item 1 was changed to "Were decision-makers concerned primarily with their personal goals, rather than with the goals of the organization?" in order to make the political aspect of the question more explicit. Item 3 was double-barreled: "Was the decision affected by the use of power *and* influence?" therefore the word influence was deleted.

➢ **Organizational Memory**

Factor analysis of organizational memory, revealed two underlying dimensions representing procedural and declarative memory. Following from this, two items were modified to represent more clearly the declarative dimension. Item 4, that was double-barreled was changed to reflect only the declarative dimension, i.e., there already existed a great amount of knowledge, rather than both knowledge and know-how. Item 6 was replaced by an item on the amount of stored data for making similar decisions.

4.3.10B Learning Process Measures

➢ **Scanning**

All nine original items were retained in the survey questionnaire, as factor analysis extracted two factors relating to the amount and breadth of market information acquired. Item 1 that loaded on the breadth, rather than the amount component of scanning, was slightly modified to "we made a considerable investment in the collection of information for this decision," given that it originally was double-barreled (see Table 4.18).

➢ **Interpretive Diversity**

The items on interpretive diversity of content and frame included in the survey questionnaire are the ones presented in Tables 4.4 and 4.6 above.

➢ **Adaptation**

Reliability analysis of the eight adaptation items showed that the alpha coefficient increases for the scale when the last item is deleted. Therefore, the first seven items were

kept in the scale and a new item representing the selection process replaced item 8(see Table 4.8): "The group information analysis process resulted in selecting an original course of action".

4.3.10C Decision Effectiveness Measures

- **Decision Quality**

Following the factor analysis, in which three factors were extracted, and a reevaluation of each item in relation to the Dooley and Fryxell (1999) decision quality scale, four of the original twelve items were eliminated from the scale. Item 10 was deleted because it alone loaded strongly on the last factor. Item 1 was eliminated because it overlapped conceptually with the items in the decision performance scale. Item 4 was eliminated because it was double-barreled and the timeliness parameter was adequately captured by item 5. Last, item 8 was excluded because it was merely a repetition of items 3 and 6.

- **Decision Creativity**

The factor and reliability analysis of the decision creativity scale indicated that items 1 and 8 should be removed from the scale. Hence, after minor wording modifications for clarity, the remaining six items were included in the main survey questionnaire.

- **Decision Performance**

All original five items were retained in the scale, as they demonstrated unidimensionality and strong internal consistency.

4.3.10D Control Variables Measures

- **Decision Complexity**

With the exception of items 8 and 11, which loaded on two separate factors and were excluded from the scale, the rest of the nine items loaded on two factors representing decision difficulty and decision variability, and were used in the survey questionnaire.

- **Environmental Turbulence**

Following the factor analysis of the 16 original environmental turbulence items developed by Jaworski and Kohli (1993), twelve were retained to describe the market

turbulence, competitive intensity, and technological turbulence. All reverse-score items had to be removed, while item 10 of the competitive intensity dimension loaded negatively on the factor.

4.4 Main Sample Survey

According to Churchill (1995: 574) "*once the researcher has clearly specified the problem and developed an appropriate research design and data collection instrument, the next step in the research process is to select those elements from which the information will be collected*". The sampling procedure consists of steps of defining the population, selecting the sampling frame, determining the sample size, and finally collecting the data.

4.4.1 Sampling Technique

Given that the unit of analysis of the study was the strategic marketing decision, a representative sample of the population of UK marketing decision-makers was sought. Accordingly, probability sampling was employed, which allows the sample elements to be selected objectively, given that each population element has a non-zero chance of being included in the sample (e.g. Churchill 1995).

4.4.2 Sampling Frame Selection

Given that the population of interest was UK marketing decision-makers, a directory with marketing managers was sought. Various directories and lists were consulted in order to acquire a reliable database of UK marketing managers such as the Dun & Bradstreet list, FAME database, the Financial Times Business Lists, and the Chartered Institute of Marketing. However, with the exception of the Dun & Bradstreet list, none of the others explicitly specialize in providing names of marketing managers. Moreover, the Dun & Bradstreet list has only a limited number of marketing managers' names (less than 2000). The Chartered Institute of Marketing, with a list of 50,000 marketing decision-makers sorted by company turnover, was therefore considered the most appropriate source. Hence, a random sample of marketing managers from the largest UK firms by turnover was selected.

4.4.3 Sample Size

Sample size was determined by the need for a sufficient number of cases for conducting data analysis. The literature on measure development advocates the use of 100 to 200 cases, in order to adequately assess the reliability and validity of the measures (Spector 1992). Moreover, the large number of variables in the theoretical model suggested that at least 200 cases would be required to properly test the variable relationships. Given that present UK response rates to postal surveys addressed to senior managers is around 14% (e.g. Caruana, Pitt, and Berthon 1999), to achieve a minimum of 200 cases, it was estimated that a sample of 2000 respondents would be required. For this purpose, CIM provided a random sample of 2000 names of marketing managers.

4.4.4 Data Collection

The 2000 questionnaires were dispatched on June 7 2000, with a covering letter explaining the purpose of the study and requesting the respondent's cooperation. The covering letter may be found in Appendix III.1. Completed questionnaires were returned to the university in the FREEPOST envelope provided.

Mail surveys are often open to doubt because of the danger of nonsampling errors they entail. Particularly, nonresponse errors, i.e., the failure to obtain data from parts of the survey population, are often cited as a source of introducing bias in the data, as respondents may differ from non-respondents (Churchill 1995; Leslie 1972). Given this drawback, several methods were used to enhance the study's response rate:

- **Anonymity and Personalization**

Anonymity, whereby the researcher does not know which individual/company responded to the study was assured. The companies in which the marketing managers work were unknown, as CIM provided only their home addresses. Moreover, although each questionnaire had a code number, it was explicitly specified that the code was included so that (1) a copy of the results could be sent to respondents and (2) that no unnecessary reminders would be sent to them. At the same time, the covering letters were personally addressed to each person and signed by the researcher and the supervisor. This was undertaken as an effort to individualize each letter. Although anonymity and personalization are generally designed to achieve opposite effects, having

combined assurances of both has been found to produce higher response rates (e.g. Hurvey 1987).

➢ **Confidentiality**

Confidentiality concerns the issue of not disclosing the information obtained from the respondent to any other person besides the researcher. Given the often sensitive nature of the questions on diversity (i.e., items assessing disagreement among members of the organization) and political behavior, confidentiality was assured in the covering letter.

➢ **Incentive**

An incentive was offered in the form of a brief summary of the study's main findings, as well as an invitation to a future presentation on the topic of decision-making in the information age. This in no way endangered the confidentiality of the responses.

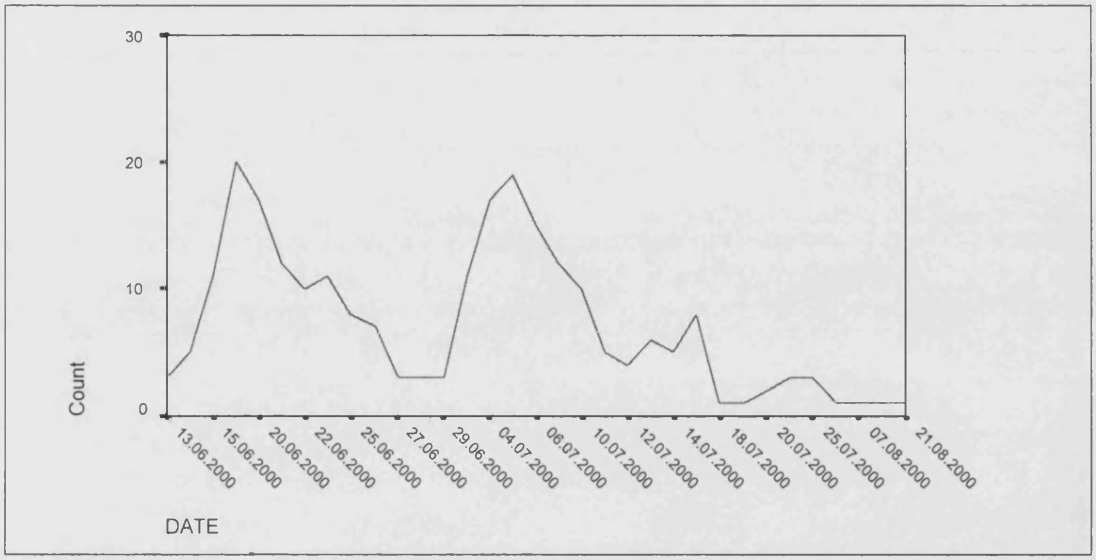
➢ **Prenotification**

No prenotification letter to potential respondents was undertaken. Although prenotification by telephone or mail has been found to be effective in increasing mail response rates (e.g. Menon et al. 1999; Comer and Kelly 1982), the implementation of such prenotification modes to 2000 people would have proved both lengthy and costly.

➢ **Follow-up**

The importance of a follow-up is well documented in the literature (e.g. Churchill 1995; Creswell 1994). Hence, approximately three weeks after the initial mailing, on June 28th 2000, reminder letters and questionnaires were mailed to non-respondents (The reminder letter is in Appendix III.3). Care was taken to make sure that managers who had already responded were not contacted again. The timing of the follow-up was undertaken according to the generally accepted practice of sending reminders after daily returns of questionnaires from the first mailing have diminished. Responses reached their lowest point at the end of June 2000 (Figure 4.3).

FIGURE 4.3: TIMING OF RESPONSES



4.4.5 Response Rate Calculation

A total of 351 questionnaires were returned, of which 254 were completed and 97 uncompleted. Of the 254 completed questionnaires 15 were considered unusable upon visual inspection, due to five respondents circling the same point throughout the questionnaire, two cases where whole sections of the questionnaire were unanswered, two reported organizational contexts (non profit organizations, charities, etc.) being inappropriate for the study, and six respondents with less than 6 months experience in the organization (test of key informant competence). Of the 97 uncompleted questionnaires, 82 were undelivered or ineligible (reasons most often cited include retirement, not currently employed, working in academia, work as independent consultants), while 15 reported that they had no time. Moreover, 6 e-mails were sent from managers who reported that they were interested in the study but felt ineligible to participate.

Following the mailing of the questionnaires a random sample of 100 non-respondents was contacted by telephone in order to determine the reasons for non-response. The reasons are reported in Table 4.21 below:

TABLE 4.21: TELEPHONE SURVEY NON-RESPONSE ANALYSIS

Reported Reasons	No. of Cases
Not delivered/wrong address	15
Respondent not currently employed	8
Very small/young company/no marketing	11
Company policy against completing surveys	6
Decisions made centrally/based elsewhere	2
Ineligible	**42**
Not interested	3
Did not have time to complete	18
Questionnaire too long	8
Questionnaire mislaid	6
Respondent unobtainable	23
Eligible	**58**
Total	**100**

In order to determine the number of ineligible cases out of the total number of non-respondents within a 95 percent confidence interval, the Daniel and Terrell (1986) formula was employed:

$$p \pm Z\sqrt{\frac{p\times(1-p)}{n}\times\frac{N-n}{N-1}}$$

where:

- p is the observed sample proportion (i.e.,, 42% ineligible),
- Z is the number of standard errors for the confidence interval (i.e., 1.96),
- n is the sub-sample of non-respondents (i.e., 100 cases contacted by phone),
- N is the total number of non-respondents (i.e., 2000 letters-254 returned questionnaires-88 ineligible returns =1658 non-respondents).

Hence, the confidence interval is calculated as follows:

$$.42 \pm 1.96\sqrt{\frac{.42\times(1-.42)}{100}\times\frac{1658-100}{1658-1}}$$

This results to: $.42 \pm .095$, indicating that between 33% and 52% of the1658 non-respondents are ineligible cases. In other words, based on the telephone survey, 547 to 862 cases are not eligible. Adding to these figures the 88 ineligible cases that responded

by returning uncompleted questionnaires, the total number of ineligible cases in this sample ranges between 635 and 950. The two response rates corresponding to the minimum and maximum illegible values are then calculated as follows:

$$\frac{254}{2000-635}=19\% \qquad \frac{254}{2000-950}=24\%$$

Based on the above, the average response rate for the main mail survey is 21.5%. This level of response is analogous to similar studies in the literature, although clearly not among the highest reported rates. For instance, Baker and Sinkula (1999) reported a response rate of 21% in an organizational learning study, while Moorman (1995) reported a response rate of 31% in a study of organizational information processing. However, it is generally believed that surveys undertaken in the US achieve higher rates of response compared to other countries (Sinkula 1995).

4.4.6 Non-Response Bias Analysis

In order to determine whether the sample suffered from non-response bias, a time trend method was used. According to Sinkula (1990: 8),"*this method assumes that subjects who respond less readily are more like non-respondents; thus significant differences between early and late responses would suggest bias*". Hence, questionnaires received before the dispatching the reminder were classified as early responses (N=113), while questionnaires received from the follow-up mailing were classified as "late responses" (N=126). Identification of the late responses was possible from the code number on each questionnaire. A series of t-tests was performed on the 14 model variables. The results are reported in Table 4.22 below.

TABLE 4.22: RESPONSE BIAS RESULTS

Variable	Mean Early Responses (N=113)	Mean Late Responses (N=126)	Sig-t (2-tailed)
Centralization	3.73	3.81	.595
Formalization	3.36	3.41	.757
Innovative Culture	4.49	4.63	.454
Interdepartmental Integration	5.09	5.25	.236
Political Behavior	3.78	3.79	.978
Organizational Memory	3.82	3.82	.980
Scanning	4.47	4.52	.755
Interpretive Diversity	4.58	4.56	.810
Adaptation	4.25	4.49	.100
Decision Quality	5.57	5.61	.755
Decision Creativity	4.81	4.77	.759
Decision Performance	4.89	4.93	.765
Decision Complexity	4.48	4.38	.435
Environmental Turbulence	4.64	4.70	.635

The non-significant two-tailed t-values obtained[4] suggest the lack of significant differences in the means of the model variables between early and late respondents. Given that late respondents may be used as an acceptable proxy for non-respondents when assessing response bias (e.g. Aaker and Day 1983), it can be inferred that the sample does not suffer from non-response bias.

4.5 Synopsis

Having described the research methodology employed to collect and assess the quality of the data, the attention now turns to the quantitative analysis of the data. The analysis is presented in the three following chapters, which respectively concern the respondents' profiles, the initial data description, and last the testing of hypotheses.

[4] Given the lack of prior directional expectations the significance of the t-value is two-tailed.

CHAPTER 5

PROFILING THE RESPONDENTS

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PROFILING THE RESPONDENTS

"Not everything that can be counted counts,
and not everything that counts can be counted."

Albert Einstein (1879 – 1955)
Sign hanging in Einstein's office at Princeton

In this chapter the profiles of the respondents are presented. Four categories make up the respondents' characteristics. The first category concerns the types of the strategic marketing decisions reported, the second category concerns the manager's personal characteristics of position and experience, and the third category refers to the age, size, and industry sector of the organizations. A section describing the respondents' profiles is important both for providing justification for the data analysis techniques to be used, as well as for providing additional information for further data analysis and discussion, in the case that findings are not significant or in contradiction to expectations (Silver 1992; Diamantopoulos and Schlegelmilch 1997). Profiling also helps with respect to generalization of the findings and concomitantly provides guidance on boundary conditions. In the sections that follow, descriptive statistics are given for nominal variables (e.g. decision type) and single item interval measures (e.g. organizational age).

5.1. Strategic Marketing Decisions: Type

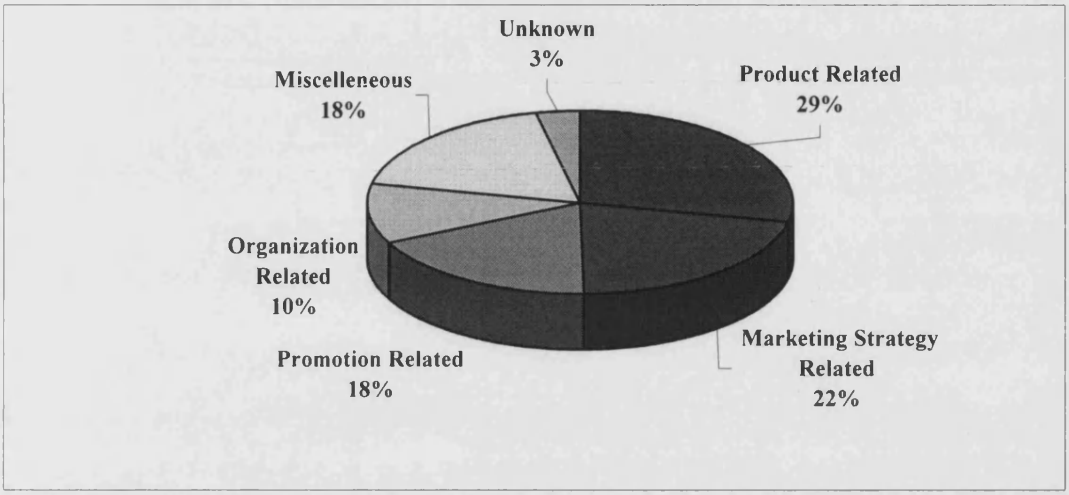
➢ Decision Types

As noted in the previous chapter, respondents were asked to describe the most recent strategic marketing decision that was made in their organization and for which performance indications were available. An exact definition of what constitutes a strategic marketing decision was not specified in the questionnaire, as according to Dean and Sharfman (1996), managers have typically no trouble identifying them. This view was also confirmed in this study, as all the reported decisions fitted the management literature description of strategic decisions, as choices with important consequences and resource demands for the organization (Mintzberg et al. 1976; Hickson et al. 1986).

Of the 239 completed questionnaires received, 231 strategic marketing decisions were provided. These decisions can be classified to 5 broad categories: Product related,

Marketing strategy related, Promotion related, Organization related, and Miscellaneous decisions. The distribution of these five categories is presented in Figure 5.1 below.

FIGURE 5.1: TYPES OF STRATEGIC MARKETING DECISIONS



A total of 68 decisions (28.5%) were classified as product related. These decisions are primarily about new product/service development or launch and secondarily, about changes in the organization's product range, brand name, or packaging.

The second biggest category (21.3%) is composed of 51 marketing strategy related decisions. These types refer to decisions to enter or exit a particular market, marketing plan implementations, and new market segmentation, targeting, or repositioning strategies.

A total of 43 decisions (18%) were related to promotional activities. Approximately half concern decisions to enter the Internet or develop a web site for promotional purposes, while the rest concern advertising and sales promotion plans.

The organization related decisions, include 25 major strategic decisions concerning restructuring of the organization, formation of strategic alliances or joint ventures, and company mergers and acquisitions.

The final category is made up of 44 decisions, categorized as miscellaneous (18.4%), which relate primarily to channel and pricing decisions and secondarily to IT applications, salesforce and budget allocation decisions.

The overall distribution of marketing decisions found in this study is similar to the one reported by Menon et al. (1999), who found that product related decisions accounted

for the majority (75%) of strategies in their sample, followed by promotion strategies (15%), and channel and pricing strategies (10%).

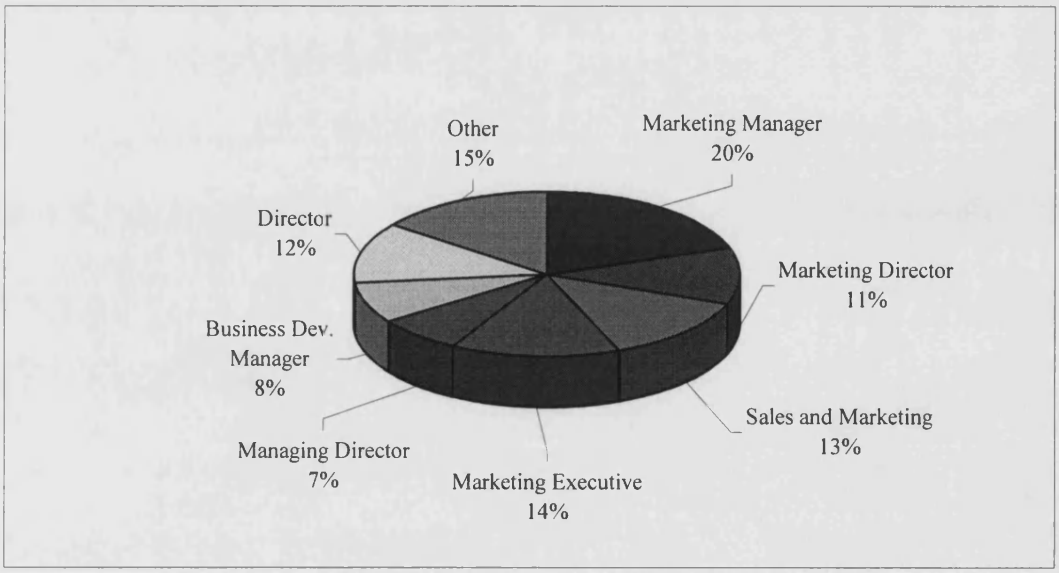
5.2 Managers' Profiles: Position & Experience

➢ Position in the Organization

To test the suitability of the key informant, respondents were asked to report their position. Overall, about 60% of respondents have a strictly marketing related position. Specifically, with reference to the key informant's position in the organization the majority is marketing managers (20%). The second biggest category (14%) are marketing executives, i.e., product managers, market research executives, market analysts, etc., followed by positions in sales and marketing (13%). Approximately 23% of respondents occupy top management positions being Marketing Directors (11%) or Directors (12%), while 7% of respondents are Managing Directors. The group of "others" includes positions in public relations, consultants, business analysts and project managers.

Overall, the seven reported categories support the involvement of the key informants in the planning and implementation of strategic marketing decisions. The distribution of managers' positions is presented in Figure 5.2 below:

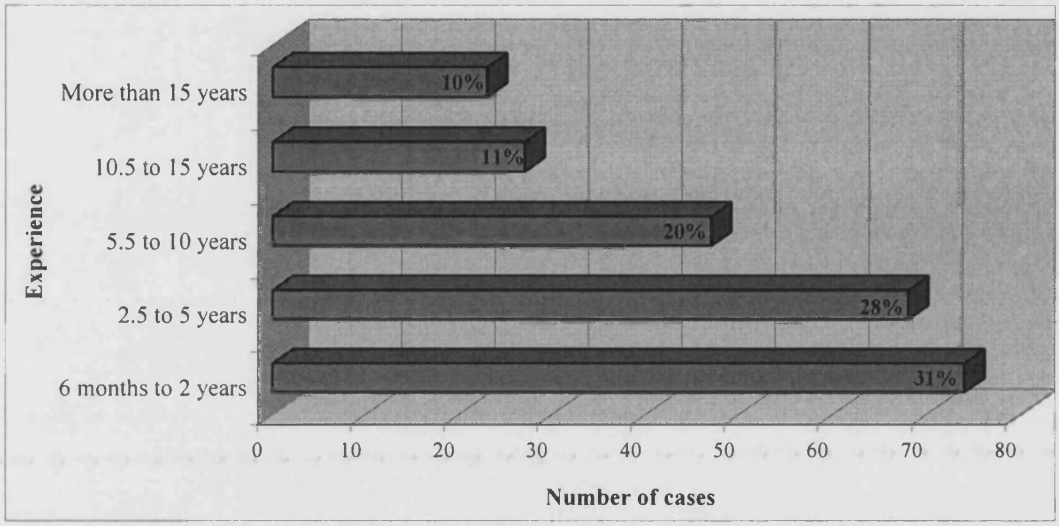
FIGURE 5.2: RESPONDENT'S POSITIONS



➢ **Managerial Experience**

The second management profile question assessed the respondents' experience. In line with Menon et al. (1999), experience was measured as the number of years the key informant worked in the reported position. The average management experience is 6.8 years, the mode being 1 year (26 cases). The standard deviation is 7 years, with overall experience ranging from 6 months to 35 years. As shown in Figure 5.3, approximately 40% of respondents have more than 5 years experience in their current position.

FIGURE 5.3: RESPONDENT'S EXPERIENCE



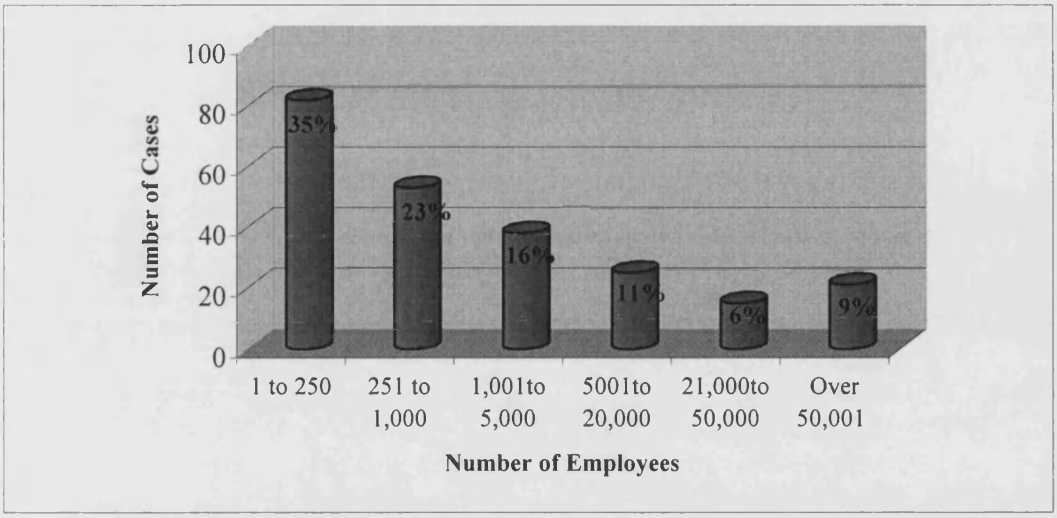
5.3 Organizational Characteristics: Size, Age & Sector

➢ **Organization Size**

Size was measured by the number of employees currently employed in the organization. The decision to determine size according to employee numbers, rather than sales turnover, was based on the fact that employment figures have been said to be more stable compared to sales figures, as they are less affected by price levels and other short term market factors (e.g. Sharkey, Kim, and Lim 1989).

The average organization size is 17,210 employees, however the very large standard deviation (44,870) indicates that organizations tend to differ widely from one another in terms of size. In fact, they range from 6 to 300,000 employees, with as many as 75% of organizations employing less than 5,000 employees. The distribution of organization size is reported in Figure 5.4 below:

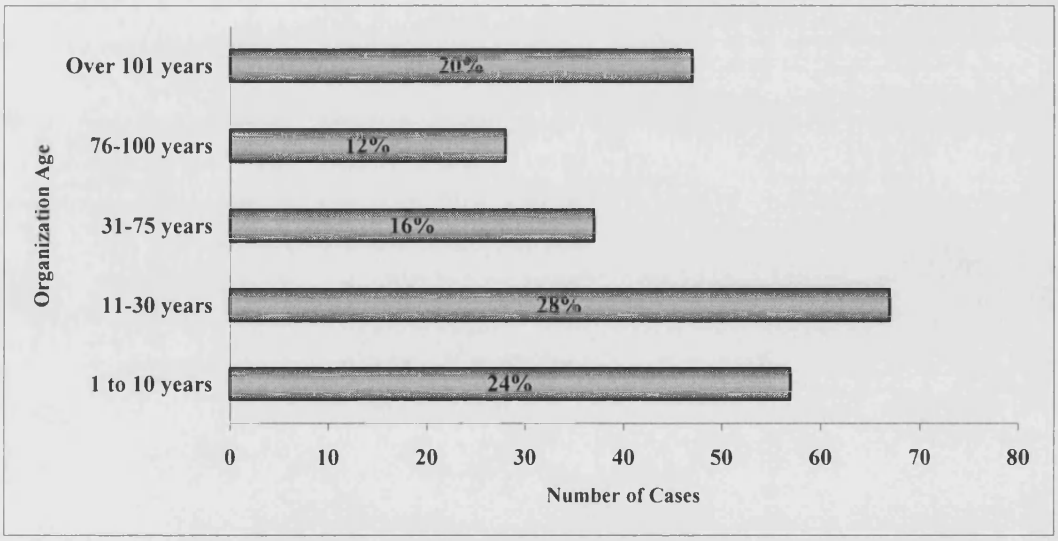
FIGURE 5.4: ORGANIZATION SIZE



➢ Organization Age

Age is measured by the number of years since the organization was established. The mean age for the organizations in the sample is 58 years, with a corresponding standard deviation of 65 years. As far as the range of ages is concerned, the youngest organization is 6 months old, while the oldest is 350 years old (the post office services). As far as the distribution of ages is concerned, it is positively skewed, with approximately 70% of organizations being less than 75 years old. The corresponding percentages are reported in Figure 5.5 below:

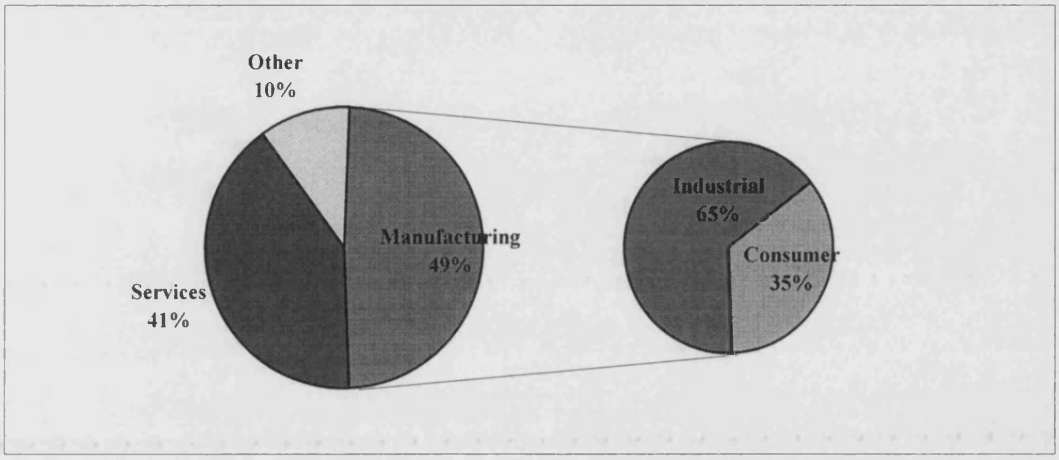
FIGURE 5.5: ORGANIZATION AGE



➢ **Sector of Activity**

Half of the organizations surveyed are involved in manufacturing, of which 65% involves industrial manufacturing, and 35% consumer manufacturing. Services account for 42% of organizations, representing mainly financial services organizations. A final category nominated "other" comprised organizations operating in the public sector, utilities (e.g. water or electricity) and media.

FIGURE 5.6: SECTOR OF ACTIVITY



5.4 Synopsis

The respondent's profiles have now been described in terms of the types their most recent strategic marketing decisions, their positions and experience, as well as the organizational age, size, and industry type characteristics. The attention now turns to the core model variables, i.e., the organizational context in which the decisions were made, the learning that occurred during the decision-making process, the decision outcomes, and finally the control factors. In the following chapter these core variables are discussed in terms of their descriptive statistics, psychometric properties, and relationships.

CHAPTER 6

INITIAL DATA ANALYSIS

CHAPTER 6

INITIAL DATA ANALYSIS

"Knowledge is the intellectual manipulation of carefully verified observations."

Sigmund Freud
Collected Writings (1924)

In this chapter, the first part of the analysis of the model variables is presented. The initial analysis consists of the data description, the assessment of the psychometric properties of the measures, and the exploration of relationships between the model variables. The chapter is categorized in four sections. First, the general approach to initial data analysis is discussed with a view to explain the theory and rationale for undertaking each step in the analysis process. The following four sections concern the presentation of the descriptives and psychometric properties of the variables in each stage of the model, i.e., organizational context, learning process, decision outcomes, and control factors. In the last section, the relationships between the antecedents, process, and consequences, are explored, thereby, setting the scene for the confirmatory statistical analysis that follows in the next chapter.

6.1 General Theory Approach

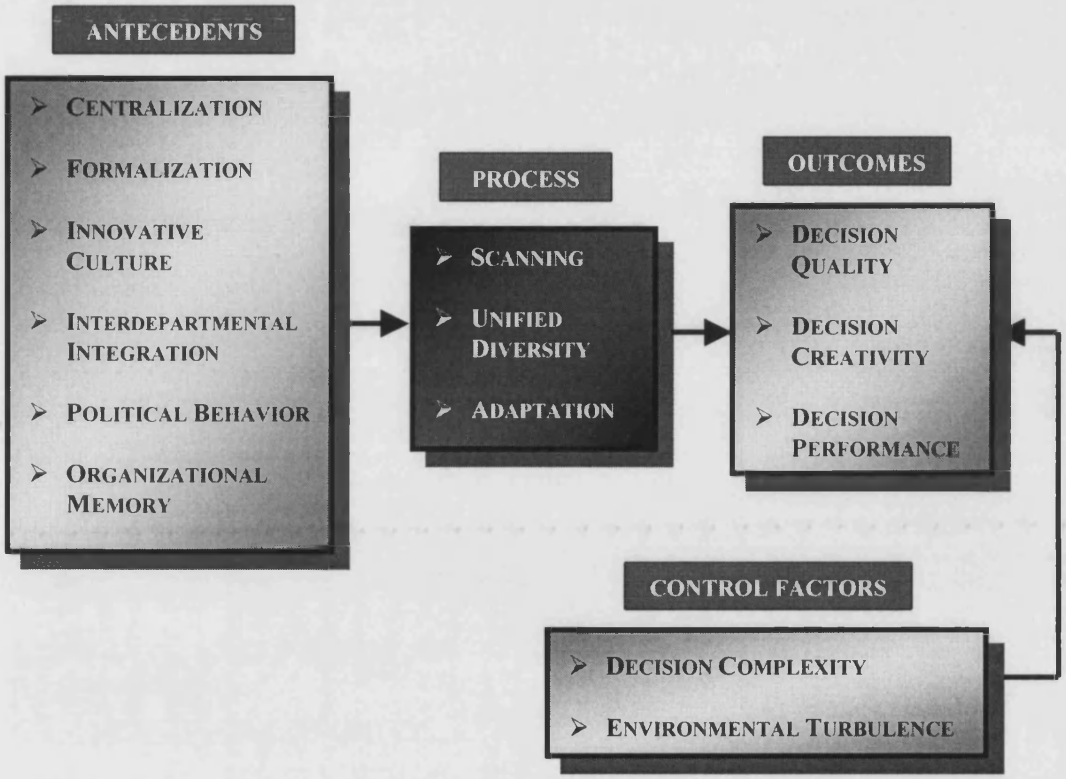
The aim in the initial data analysis is to (1) provide preliminary insights to the nature and structure of the data, (2) assess the overall quality of the data, (3) undertake the exploratory analysis of the data, (4) assess the psychometric properties of each scale, i.e., dimensionality, reliability, and validity, and (5) search for relationships between the model variables.

6.1.1 Nature and Structure of the Data

The data set involves a sample of 239 cases and fourteen variables, which can be classified as (1) antecedent variables, referring to organizational context; (2) process variables, referring to the learning process; (3) output variables, referring to decision effectiveness; and (4) control variables, referring to decision complexity and environmental turbulence. All variables are measured on a 7-point Likert type scale and can be, therefore, treated as interval data, which greatly expands the range of statistical

manipulation possible in comparison to nominal or ordinal level data (e.g. Diamantopoulos and Schlegelmilch 1997). The variables are summarized in Figure 6.1 below.

FIGURE 6.1: THE MODEL VARIABLES



6.1.2 Data Quality

In assessing the data quality, the major concern is with examining the data to identify if there are any missing values or outliers (Silver 1992). Overall, the missing values in the data set were relatively few and upon visual inspection of the questionnaires, most of them were attributed either to respondents skipping an item by mistake or, in certain cases, to the question not applying to the respondents' particular decision/organization. Following the recommendations of Hair et al. (1998) regarding missing values, and given that the existing sample size was somewhat below the recommended 5:1 ratio of sample size to parameter estimate (Bentler and Choo 1988 cited in Moorman and Miner

1997), the missing values were replaced with the average of the series, so that the sample size would not be reduced.

In terms of outliers, detection at the univariate level revealed a number of extreme values. However, close inspection of the questionnaires suggested that the outliers were neither due to data coding errors, nor due to genuinely extraordinary cases. Therefore, there wasn't enough support to delete them and it was decided to retain them in the analysis.

6.1.3 Exploratory Analysis

The objective of the exploratory analysis is to summarize and describe the data. The summary measures used in the analysis, concern each variable's averages, dispersion, and distribution. The summary measures for each variable are presented and discussed in sections 6.2 to 6.4 of this Chapter. A table summarizing the descriptives of all the model variables can be found in Appendix III.4.E.

6.1.4 Dimensionality Assessment

One of the most critical assumptions of measurement theory is that a set of items captures just one underlying construct (Hattie 1985). Factor analysis is a multivariate statistical method that allows assessment of the dimensionality of measurement scales, by determining a set of common underlying dimensions called factors, which are used to define the underlying structure of a set of items. With factor analysis "*the researcher can first identify the separate dimensions of the structure and then determine the extent to which each variable is explained by each dimension*" (Hair et al. 1998: 90). The test of unidimensionality is that each scale should consist of items loading on one factor, or alternatively, if the scale is proposed to have multiple dimensions, that each dimension should be reflected by a separate factor. In addition to dimensionality assessment, factor analysis allows simplification of the subsequent multivariate analysis by reducing the original number of items, without altering the nature and character of the original variables (Hair et al.1998).

Here, unidimensionality is assessed with exploratory factor analysis. Factors are rotated via an orthogonal rotation procedure, used to simplify the factor solutions (Kim and Mueller 1978). Specifically, this type of rotation permits the factors to be differentiated from each other by maximizing the loading of a variable on one factor and

minimizing the loading of that same variable on other factors. The orthogonal approach is chosen over oblique factor rotation, because it is more widely used and because oblique rotation is still the subject of controversy (Hair et al. 1998). Moreover, the orthogonal rotation method is considered easier to interpret (Kim and Mueller 1978).

A varimax orthogonal factor procedure is employed, as it tends to give a more clear separation of factors. According to Sharma (1996), "*in the varimax rotation the major objective is to have one factor structure in which each variable loads highly on one and only one factor. That is, a given variable should have a high loading on one factor and near zero loadings on other factors*" (p.119). Furthermore the varimax rotation has proved very successful as an analytic approach to obtain an orthogonal rotation of factors and is relatively free of criticism (Hair et al. 1998).

In interpreting the factors, the researcher must decide which factor loadings should be considered. According to Hair et al. (1998), a practical suggestion is to use the absolute size of a factor loading as an indication of significance. Hence, factor loadings over ±.3 are considered to meet the minimal level, while anything above ±.5 is considered as practically significant. In assessing statistical significance, the concept of statistical power[1] can be employed to specify which factor loadings are significant for different sample sizes. Hence, for a sample size of 239, at the .05 level of significance, a factor loading of at least ±.40 is required for statistical significance (Hair et al. 1998). The factor analysis results for all the scales are reported in Appendix III.4 and are discussed in depth in sections 6.2 to 6.4 of this chapter.

6.1.5 Reliability Assessment

The second step in assessing the measures' psychometric properties involves the estimation of the scales' reliability. Reliability refers to "*the assessment of the degree of consistency between multiple measures of a variable*" (Hair et al. 1998: 117).

There are two basic methods for assessing the reliability of a scale, test-retest and internal consistency (Hair et al. 1998). The test-retest method requires respondents to be questioned at two different points in time, which in this instance was not feasible, due to the time constraints of the study. Hence, the internal consistency method was employed, which "*is an indicator of how well the individual items of a scale reflect a common, underlying construct*" (Spector 1992: 65).

[1] Power is the probability that statistical significance will be indicated when present (Hair et al. 1998).

The first step in determining scale reliability is to perform an item analysis, with a view to identifying the items that form an internally consistent scale and eliminating those that do not. The procedure involves correlating (1) each item with the sum of the relating items (item-total correlations) and (2) each item with every other item (inter-item correlations). Rules of thumb suggest that that the item-total correlations exceed .50 and that the inter-item correlations exceed .30 (Hair et al. 1998). Moreover, Cronbach's alpha measure of internal consistency is computed for each scale. As a rule, scales with a Cronbach alpha over .70 (Nunally 1978) are considered as internally consistent, although this threshold may decrease to .60 in exploratory research (Hair et al. 1998). Another issue in assessing Cronbach's alpha is its positive relationship to the number of items on the scale, suggesting that researchers must place more stringent requirements for scales with large numbers of items (Hair et al. 1998). The reliability analysis for the measures are reported in Appendix III.4 and their discussion is presented in sections 6.2 to 6.4 of this chapter.

6.1.6 Validation

"*Having ensured that a scale (1) conforms to its conceptual definition, (2) is unidimensional and (3) meets the necessary levels of reliability, the researcher must make one final assessment: scale validity*" (Hair et al. 1998: 118). Generally, a scale is considered valid if it accurately represents the concept of interest (Churchill 1998).

Content or face validity (the extent to which a scale conforms to its conceptual definition), was ensured through (1) direct derivation from the academic literature in most cases, and (2) in the case of the entirely new scales, through assessment and verification of the concepts (and the corresponding items) by experts (i.e., academics and managers), as well as pretests on multiple populations (e.g. Hair et al. 1998), as discussed in Chapter 4.

The other most widely accepted forms of validity, i.e., convergent, discriminant, and nomological (e.g. Peter 1981), are measured empirically by the correlation between theoretically defined sets of variables. Convergent validity assesses the degree to which different measures of the same construct relate strongly to each other (Spector 1992). Discriminant validity refers to the degree to which two conceptually similar concepts are distinct (Churchill 1995). Finally, "*nomological validity refers to the degree to which*

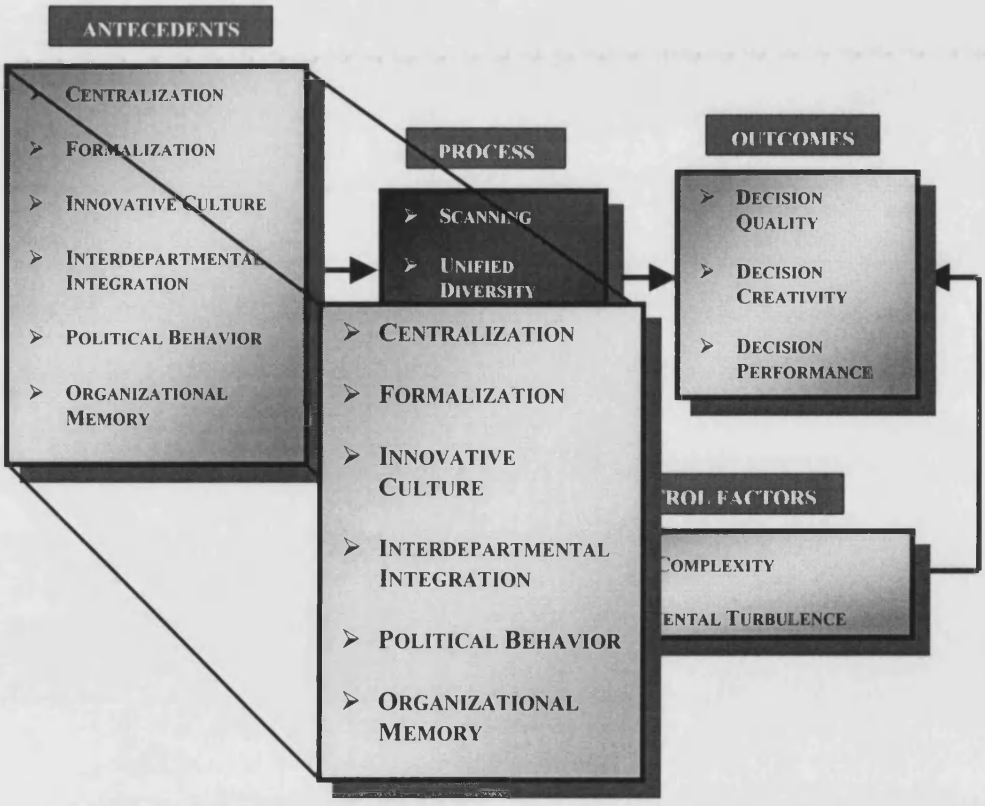
that the summated scale makes accurate predictions of other concepts in a theoretically based model" (Hair et al. 1998: 118).

Given that the majority of the scale items are adapted from theoretically and empirically established instruments, the main concern is to provide evidence of discriminant validity; with the exception of the new interpretive diversity scale and the three decision outcomes scales that are tested for both convergent and discriminant validity. Finally, the nomological validity of the scales is inferred from the last section of the chapter were the theoretical relationships between the constructs proposed in Chapter 3, are explored.

6.2 Organizational Context Variables

This section concerns the initial data analysis of the organizational context antecedent variables, presented in Figure 6.2 below:

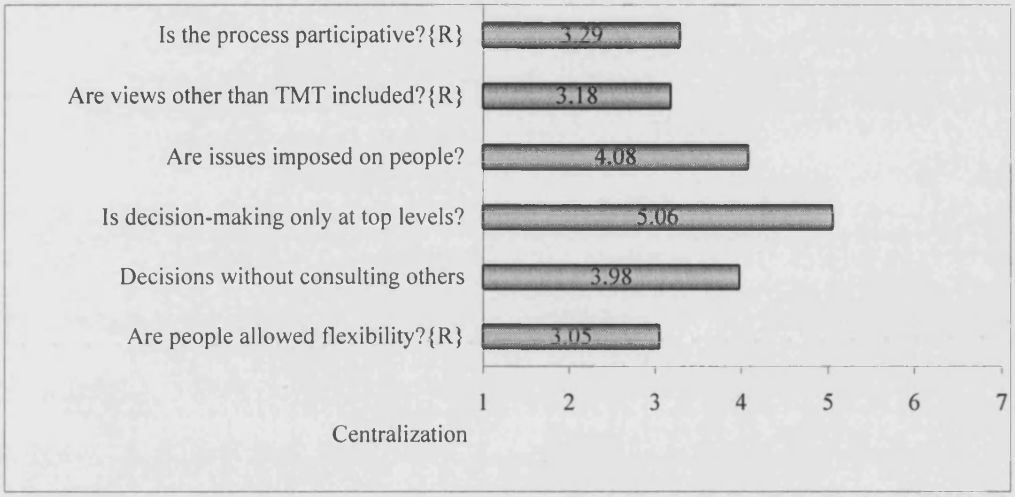
FIGURE 6.2: ANTECEDENT VARIABLES



6.2.1 Centralization of Structure

Centralization of structure was measured with six items presented in Figure 6.2.1 Overall, the mean scores of the six items vary considerably from 3.05 for item 6 concerning flexibility, to 5.06 for item 4, concerning the level at which decision-making takes place.

FIGURE 6.2.1: MEAN RESPONSES TO CENTRALIZATION ITEMS



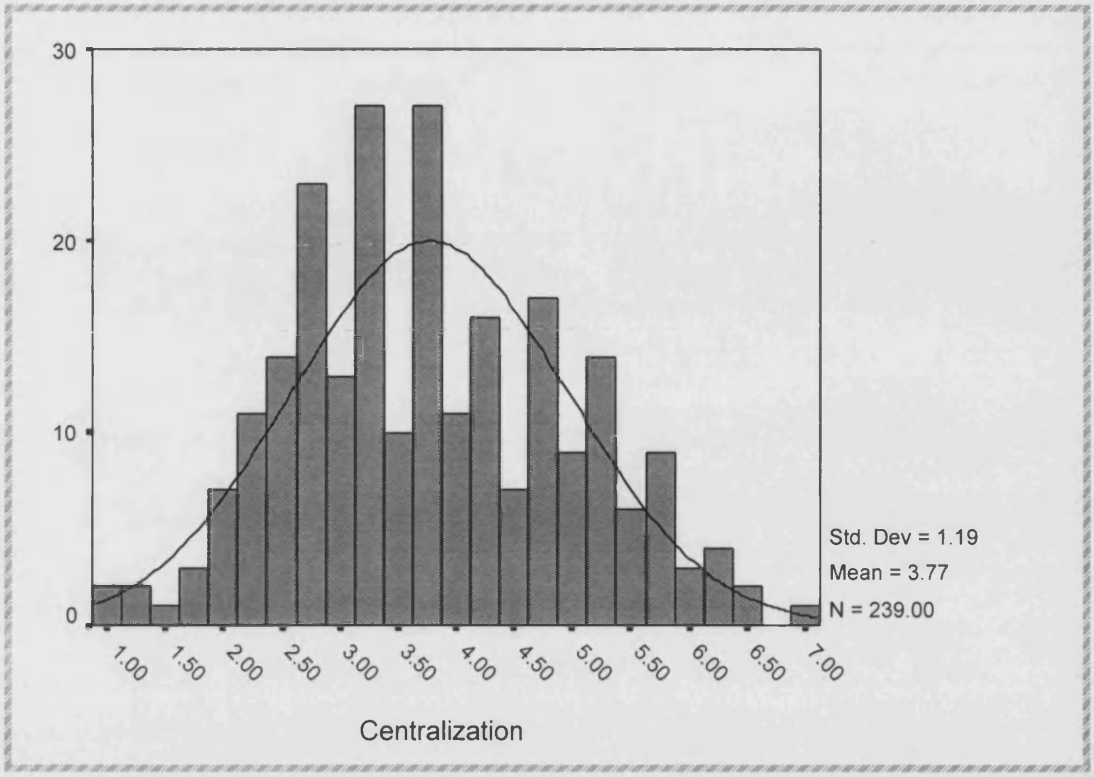
R: Reversed score item

The principal components analysis extracted one factor accounting for 49.7% of the variance with an eigenvalue of 2.98. This result confirms the unidimensional structure of centralization and is consistent with the Menon et al. (1999) and the Menon et al. (1996) studies.

Reliability analysis of the six items revealed that Cronbach's alpha for the scale is at .79, well above the accepted threshold for reliable scales proposed by Nunally (1978). Hence, given that the item-to-total correlations were at generally acceptable levels (the lowest coefficient being at .41) and that alpha does not improve with the deletion of any item, all six items were retained in the scale.

The mean score for the centralization scale is at 3.8, very close to the scale's middle point 4, and the standard deviation is at 1.2. The median is at 3.7 indicating that the sample is almost equally split between organizations that are highly centralized and organizations that are decentralized. Figure 6.2.2 shows the distribution of the variable, which appears to be relatively symmetric with no significant departures from normality as indicated by the Kolmogorov-Smirnov test (K-S Z=1.16; p=.13)

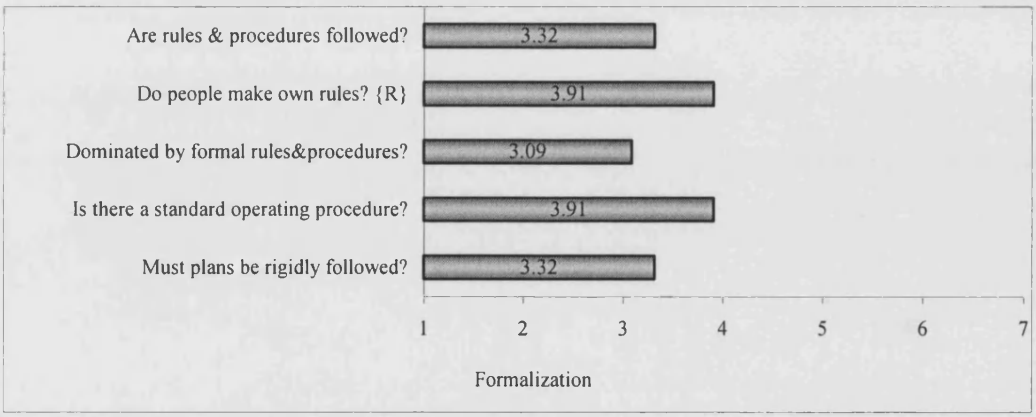
FIGURE 6.2.2: HISTOGRAM OF CENTRALIZATION OF STRUCTURE



6.2.2 Formalization of Structure

Formalization of structure was measured with five items presented in Figure 6.2.3. The mean scores of all five items are below the scale mid-point 4, while there are no significant variations among the five items' averages.

FIGURE 6.2.3: MEAN RESPONSES TO FORMALIZATION ITEMS

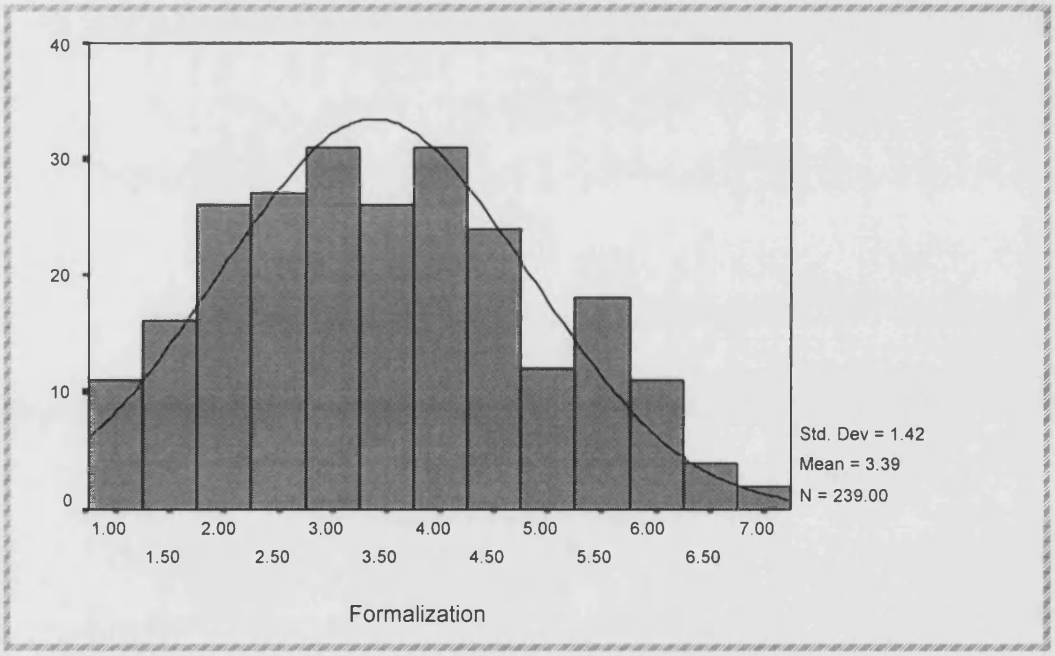


The factor analysis revealed a one-factor structure, explaining 59% of the variance, with an eigenvalue of 2.95. However, the second item, a reversed score item regarding the extent to which people make their own rules on the job, loads relatively weakly (.47) on the factor.

Reliability analysis of the formalization scale uncovered a Cronbach's alpha of .82. However, the item-total analysis shows that the second item has a low item-total correlation coefficient (.38) and that the scale alpha improves to .85 when this item is deleted. Hence, based on the factor loadings and the reliability analysis, it was decided to remove the item from the scale.

The distribution of the formalization scale is presented in Figure 6.2.4 below. The average score is 3.39 and the standard deviation is quite high at 1.42. This finding supports past evidence of relatively low levels of formalization during marketing strategy making reported in the study of Menon et al. (1999). The distribution of the variable has a slight positive skew (.263), but is confirmed as normal by the Kolmogorov-Smirnov test (K-S Z= 1.12; p=.16).

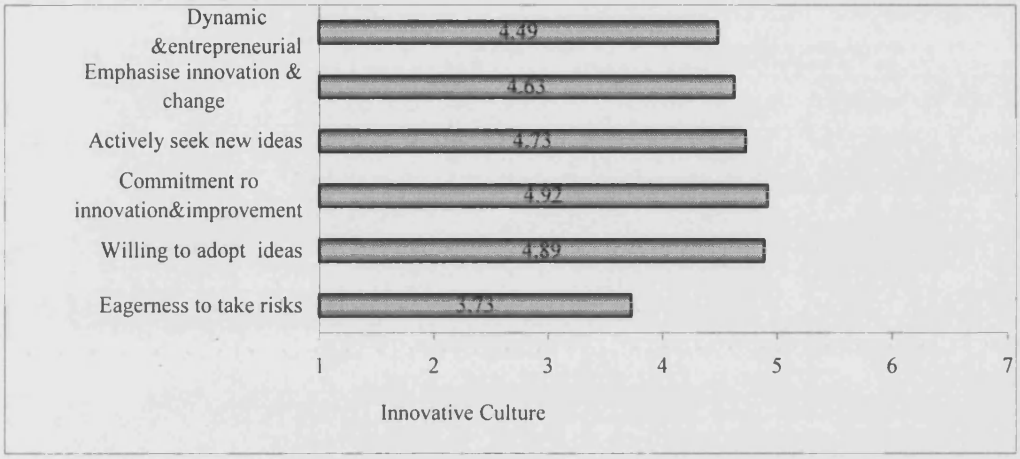
FIGURE 6.2.4: HISTOGRAM OF FORMALIZATION OF STRUCTURE



6.2.3 Innovative Culture

Innovative culture was measured with six items, presented in Figure 6.2.5. With the exception of the last item, concerning the eagerness to take a risk, which has a relatively lower average (3.7), mean responses of the other items are above the scale mid-point, ranging from 4.5 to 4.9.

FIGURE 6.2.5: MEAN RESPONSES TO INNOVATIVE CULTURE ITEMS

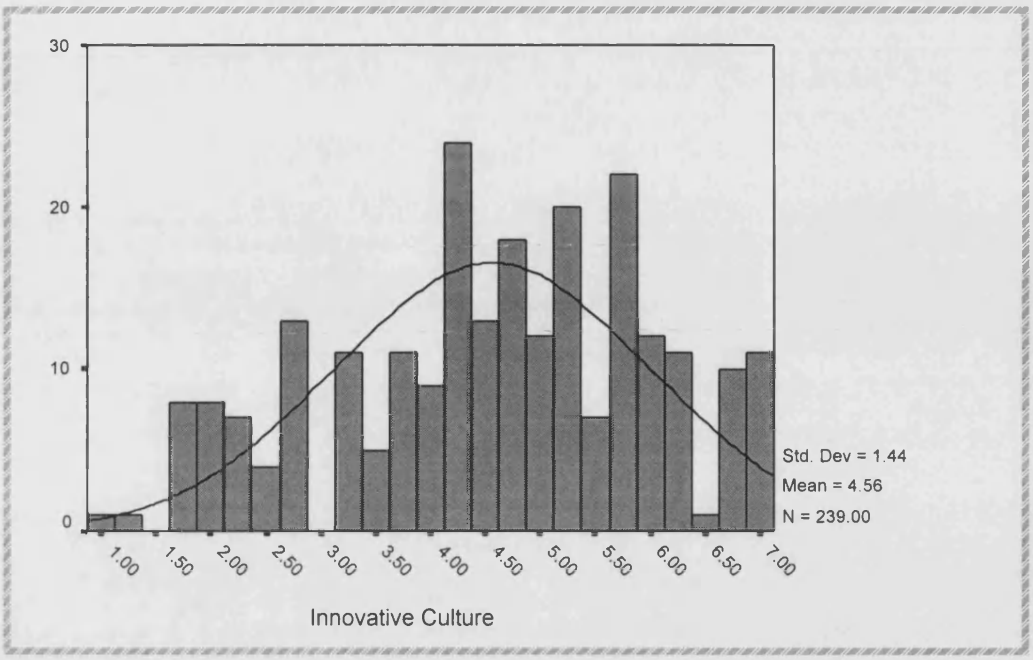


The principal components analysis revealed a single factor structure for innovative culture. The factor accounts for a large percentage of the variance, i.e., 76%, while the reported eigenvalue is at 4.5.

The scale's Cronbach's alpha is also very high at .93, while all the item-total correlation coefficients are well above .70. Based on these results, all six items were retained in the scale.

The mean score of the scale is 4.6, matching the Menon et al. (1999) average that was also .5 above the scale middle point. The standard deviation is quite high at 1.4 and the scale median is at 4.7. The distribution (Figure 6.2.6) appears to have a slight negative skew (-.329), but does not deviate significantly from normality (K-S Z=1.06; p=.21).

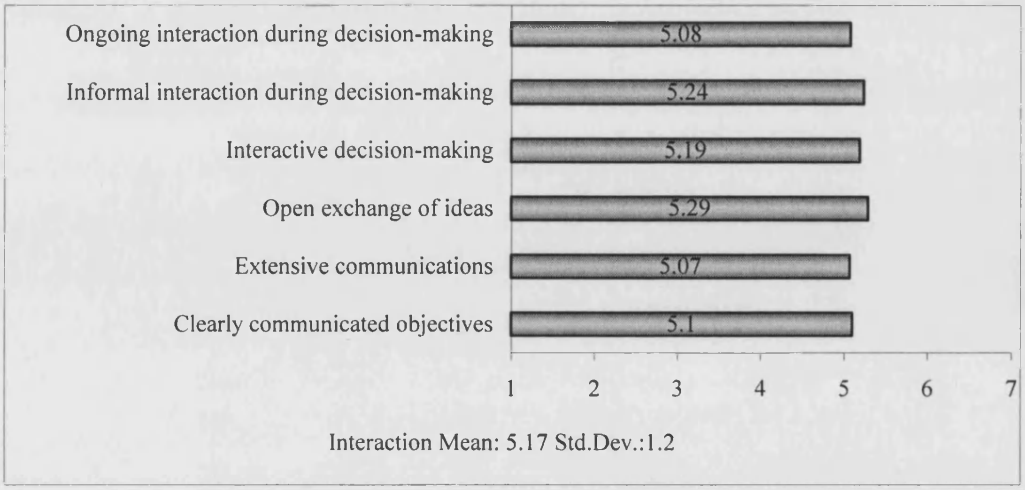
FIGURE 6.2.6: HISTOGRAM OF INNOVATIVE CULTURE



6.2.4 Interdepartmental Integration: Interaction & Collaboration

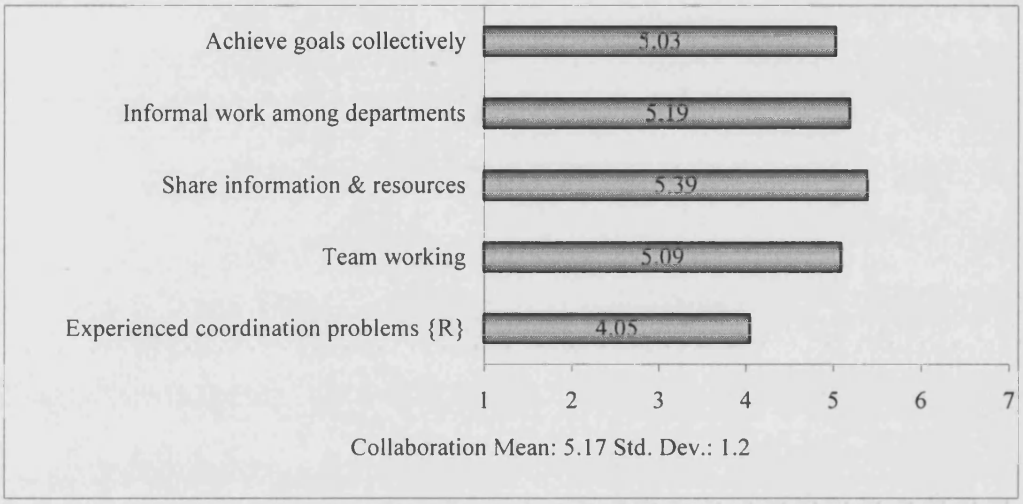
Interdepartmental integration was measured along the two dimensions of interaction and collaboration between organizational departments. Interaction was measured by the six items presented in Figure 6.2.7 below. The average of the dimension is 5.2, well above the scale mid-point, while there is very little variation between the mean scores for each item. The standard deviation for interaction is 1.2.

FIGURE 6.2.7: MEAN RESPONSES TO INTERACTION ITEMS



As far as collaboration is concerned, the average and standard deviation for the dimension is the same with interaction at 5.17 and 1.2 respectively. There is however, considerable variation among the last item (mean score 4.05), a reversed score item concerning the existence of coordination problems during decision-making, and the other items on the scale (highest mean at 5.39).

FIGURE 6.2.8: MEAN RESPONSES TO COLLABORATION ITEMS



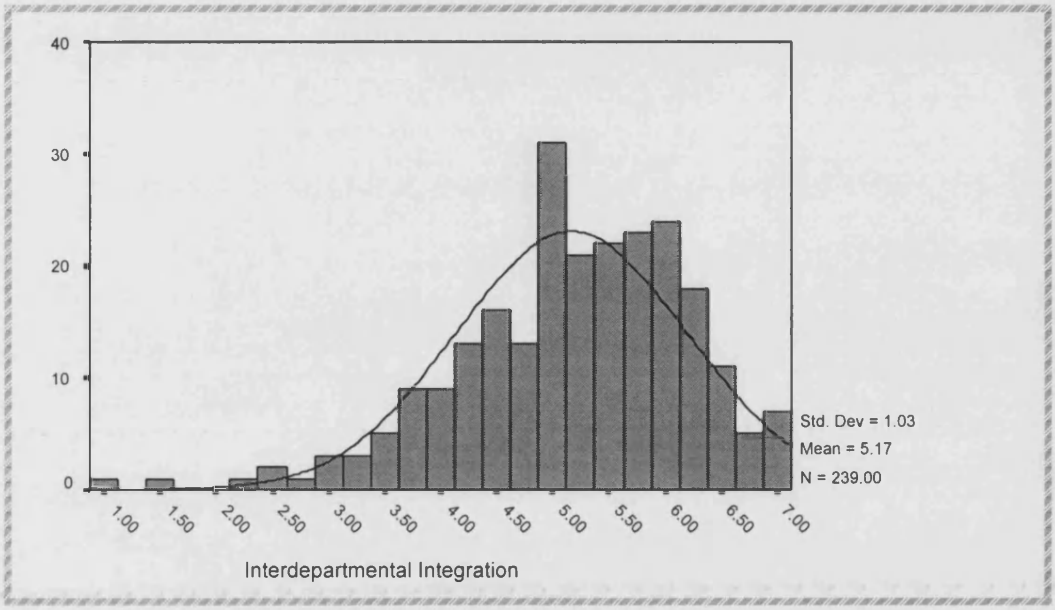
The 11 items were subjected to principal components analysis, which revealed a three-factor structure. The first factor accounts for almost 50% of the variance and consists of the six interaction items. The second factor has an eigenvalue of 1.6, above the generally acknowledged limit beyond which a factor is accepted, and consists of items one to four of the collaboration dimension. The last item does not load on any of the two dimensions. Overall, the two first factors explain 65% of the variance and by and large confirm the predicted two-dimensional structure of the interdepartmental integration construct.

The reliability analysis of the interdepartmental integration scale produced a high Cronbach's alpha, at .89, which improves to .91 when the last item of the collaboration dimension is deleted. Moreover, an examination of the item-to total correlations reveals high coefficients for all items (above .6), except for the last (.17). Based on these findings the last item was excluded from the scale.

The mean score for interdepartmental integration is quite high at 5.2 and the distribution is negatively skewed (-.77), indicating that organizations in the sample have departments that interact openly and frequently and manage to collaborate effectively

during strategic marketing decision-making. This finding is also consistent with Menon et al. (1999) and Ottum and Moore (1997). The median is equal to the mean, while the standard deviation is 1. The Kolmogorov-Smirnov test indicates that the distribution does not depart significantly from normality (K-S Z=1.17; p=.131).

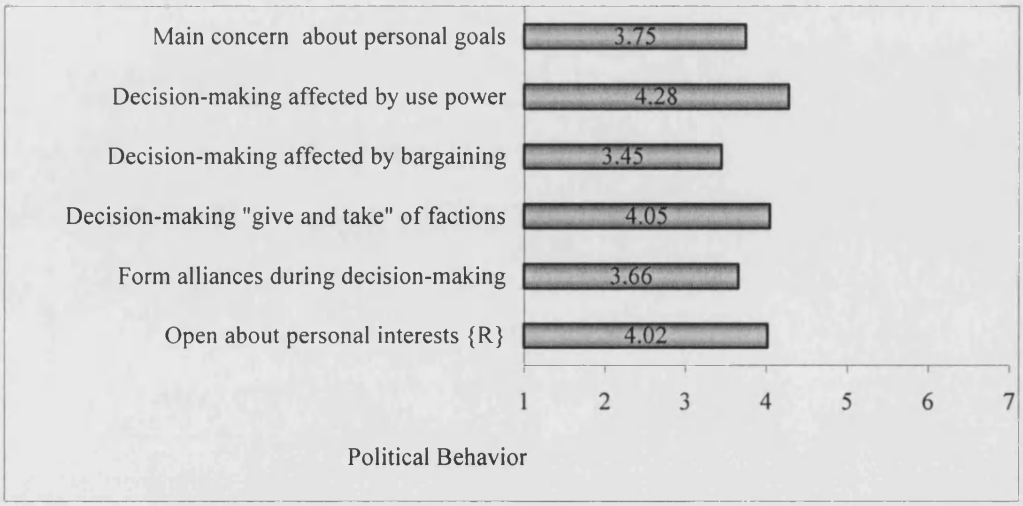
FIGURE 6.2.9: HISTOGRAM OF INTERDEPARTMENTAL INTEGRATION



6.2.5 Political Behavior

Political behavior was measured with the six items presented in Figure 6.2.10 below. The mean scores of items vary between 3.45 and 4.28, indicating an average level of political activity in these organizations.

FIGURE 6.2.10: MEAN RESPONSES TO POLITICAL BEHAVIOR ITEMS

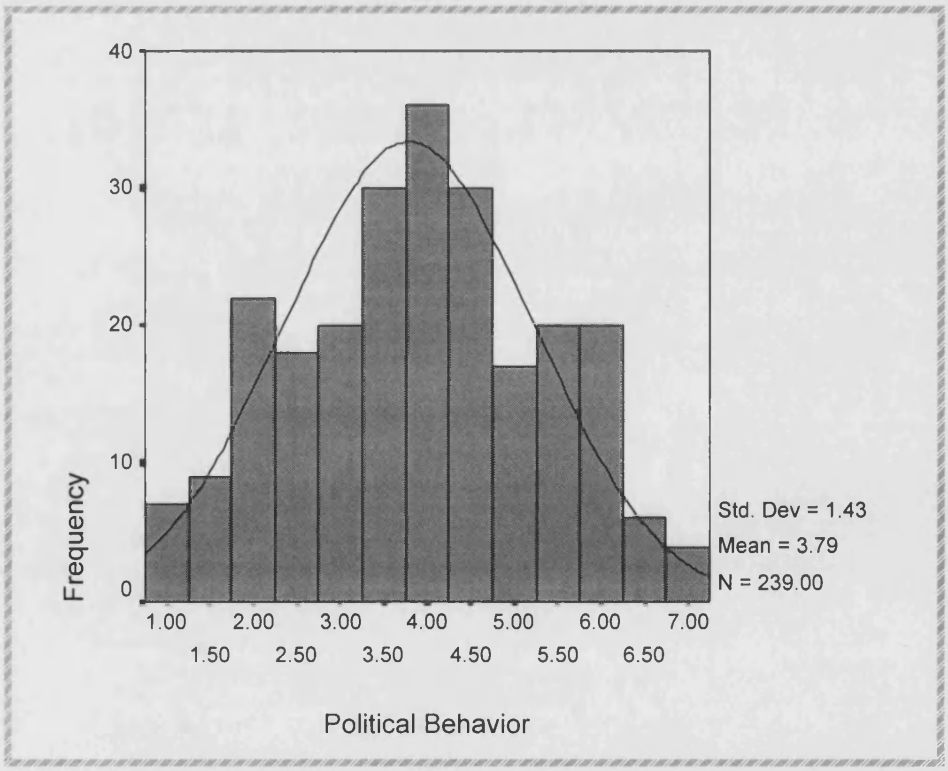


The factor analysis extracted two factors. The first factor is comprised by items 3, 4, and 5 and accounts for 58.68% of the variance. The other factor, i.e., items 1, 2, and 6, has an eigenvalue of 1.14 and explains an additional 19% of the variance.

According to the reliability analysis, the six items have a Cronbach's alpha of .79, which appears to be improving when the items 4 and 6, which have weak item-total correlation coefficients (.38 and .36 respectively), are deleted. Indeed, when assessing the scale reliability without items 4 and 6, all item-total coefficients rise above .6 and the scale's alpha increases to .82. It was therefore decided to remove the two items from the scale.

The distribution of political behavior is presented in Figure 6.2.11 below. The mean score of the scale is very close to the mid-point, at 3.8. The median equals the mean, the standard deviation is relatively high at 1.4, and the distribution is symmetrical and normal (K-S Z=.99; p=.279), indicating that the sample is equally split between organizations with higher and lower level of politics. This finding is interesting given that Dean and Sharfman (1996) report a much lower mean (2.87) and standard deviation (.7) on a 7-point scale for political behavior on their sample of US firms.

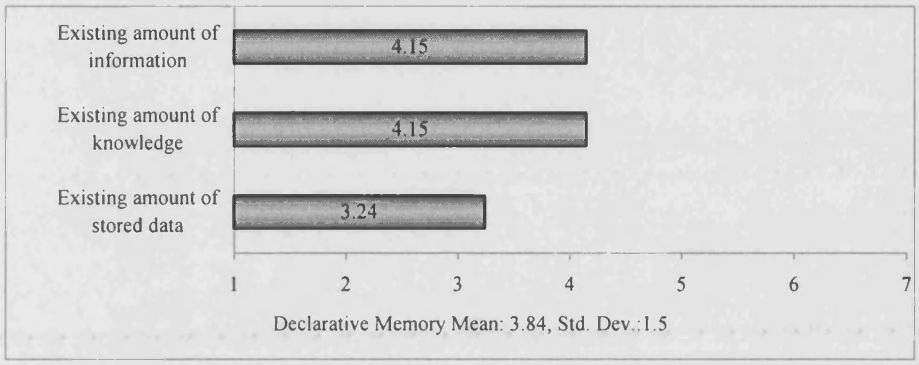
FIGURE 6.2.11: HISTOGRAM OF POLITICAL BEHAVIOR



6.2.6 Organizational Memory: Declarative & Procedural

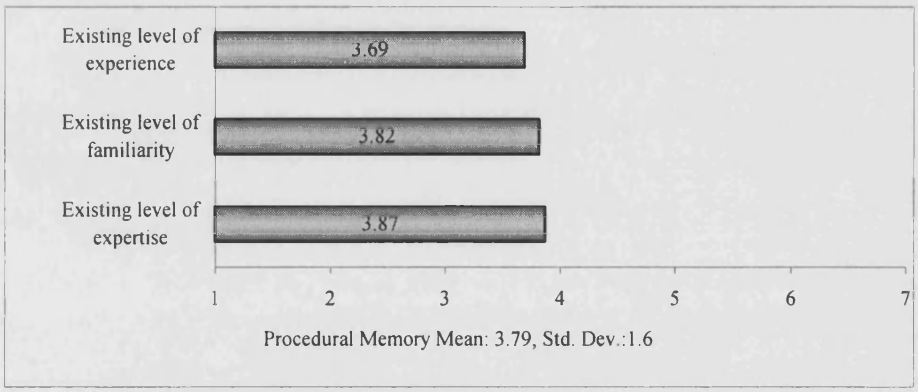
The level of organizational memory was measured along the two dimensions of declarative and procedural memory. The mean scores of the three items in the declarative dimension are presented in Figure 6.2.12 below. Item 3 concerning the amount of data that existed in the organization prior to initiating the decision-making process and acquiring any new information, has the lowest average at 3.24. The mean score for the declarative dimension is 3.84, with a standard deviation of 1.5, indicating that respondents in the sample perceive that their organizations have average knowledge pools for facts, concepts, or events.

FIGURE 6.2.12: MEAN RESPONSES TO DECLARATIVE MEMORY ITEMS



Procedural memory was measured with the three items presented in Figure 6.2.13. The averages of responses along the three items is relatively unvarying around the procedural dimension mean at 3.79. As in the case of declarative memory, organizations in the sample appear to have average levels of know-how and skills for making strategic marketing decisions.

FIGURE 6.2.13: MEAN RESPONSES TO PROCEDURAL MEMORY ITEMS

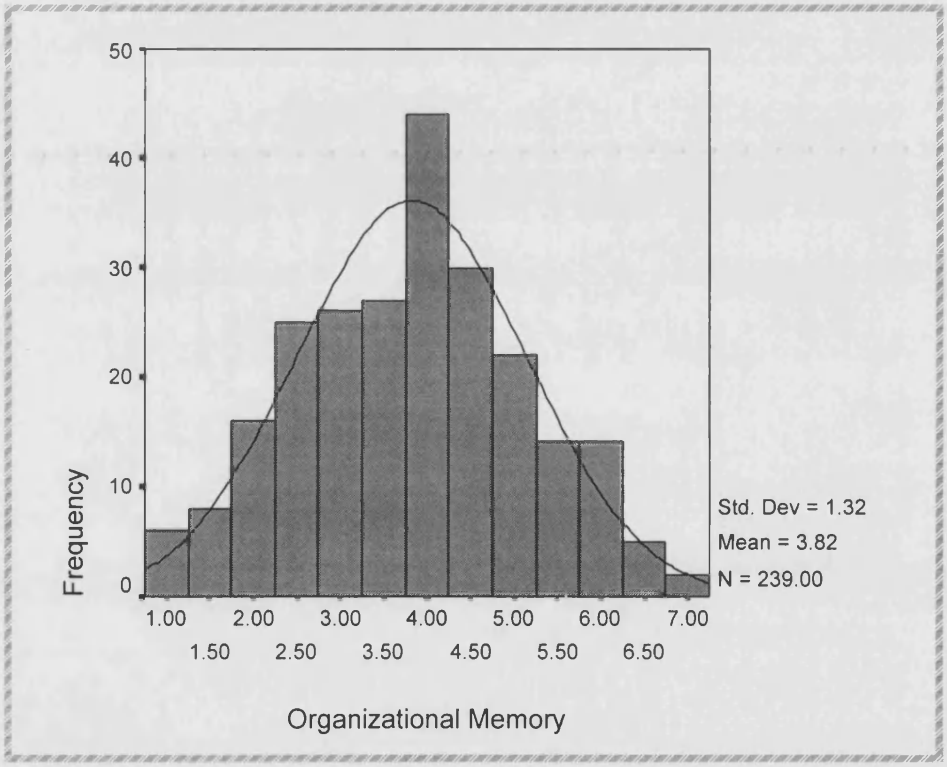


The factor analysis on the six items measuring organizational memory confirmed the two dimensions of declarative and procedural memory. For both factors their respective eigenvalues are well above 1, while together they explain 78.5% of the scale's variance.

Reliability analysis of the six organizational memory items reveals that the scale is internally consistent, the standardized alpha being .85 and the item-total coefficients being well above .5.

The variable's distribution is shown in Figure 6.2.14 below. The mean of organizational memory is 3.8, which is equal to the mean, and the standard deviation is 1.3. The distribution is symmetrical (skewness is at .00) and normal. Overall, compared to Moorman and Miner's (1997) US average for organizational memory level (5.26), organizations in this sample report much lower levels of memory.

FIGURE 6.2.14: HISTOGRAM OF ORGANIZATIONAL MEMORY



6.2.7 Validity Assessment Of Organizational Context Scales

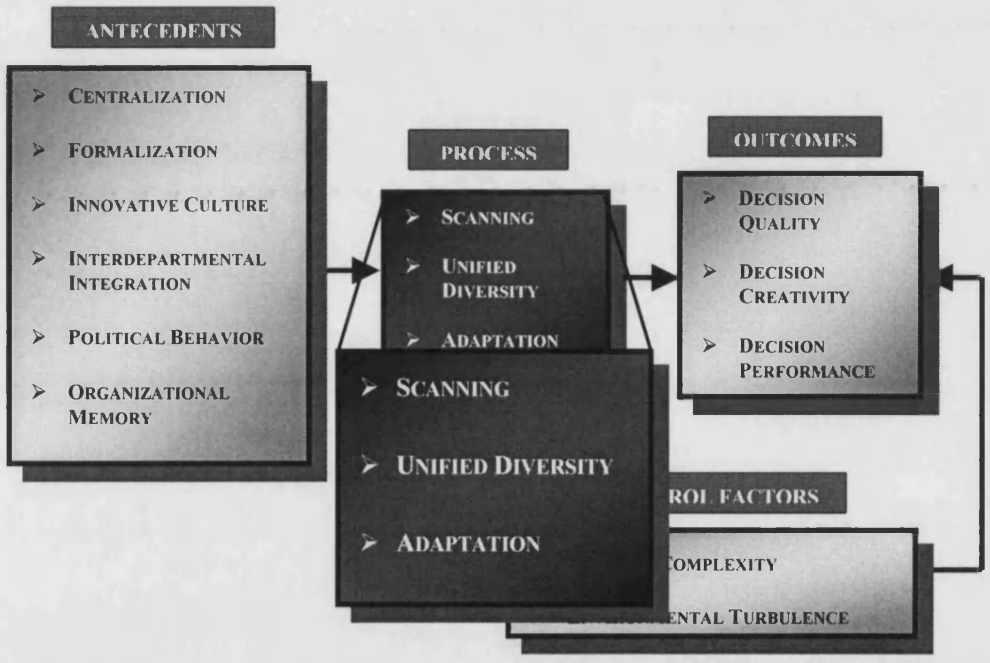
As noted in the first section of this chapter, content validity of the organizational context scales is acknowledged, given that each item was taken directly from the literature.

Discriminant validity was established by performing a factor analysis on all the items describing organizational context. The results of the factor analysis on the items are presented in Appendix III.4.A. Eight factors were extracted as expected, each factor having an eigenvalue comfortably over 1 and each item having a factor loading well over .5. Since each of the extracted factors represents a construct, or a dimension of a construct, discriminant validity of the organizational context scales is satisfied.

6.3 Learning Process Variables

This section concerns the initial data analysis of the learning process variables, presented in Figure 6.3 below:

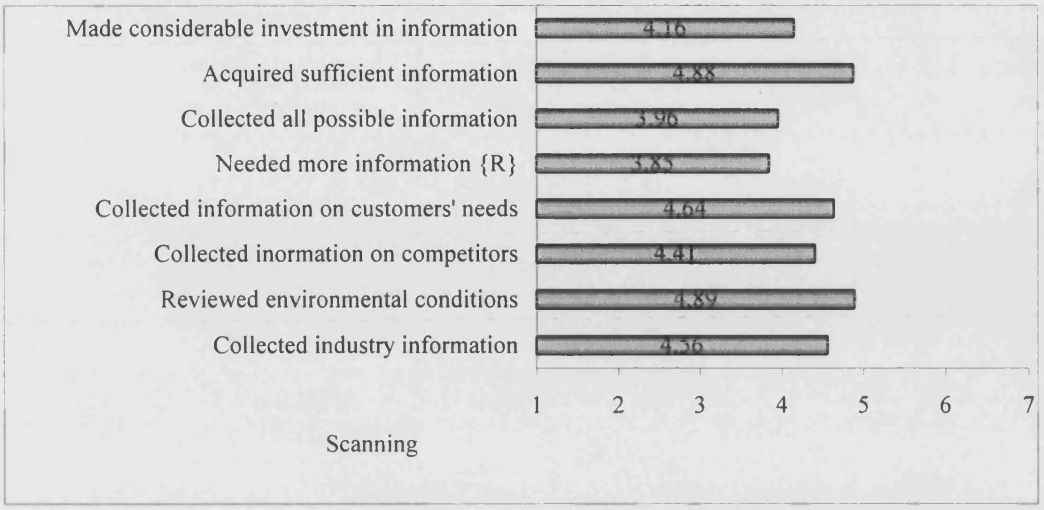
FIGURE 6.3: PROCESS VARIABLES



6.3.1 Scanning

Scanning was measured with eight items concerning the amount and breadth of new information acquired for the particular decision. As shown in Figure 6.3.1 average responses between the scanning items range from 3.85 to 4.89.

FIGURE 6.3.1: MEAN RESPONSES TO SCANNING ITEMS

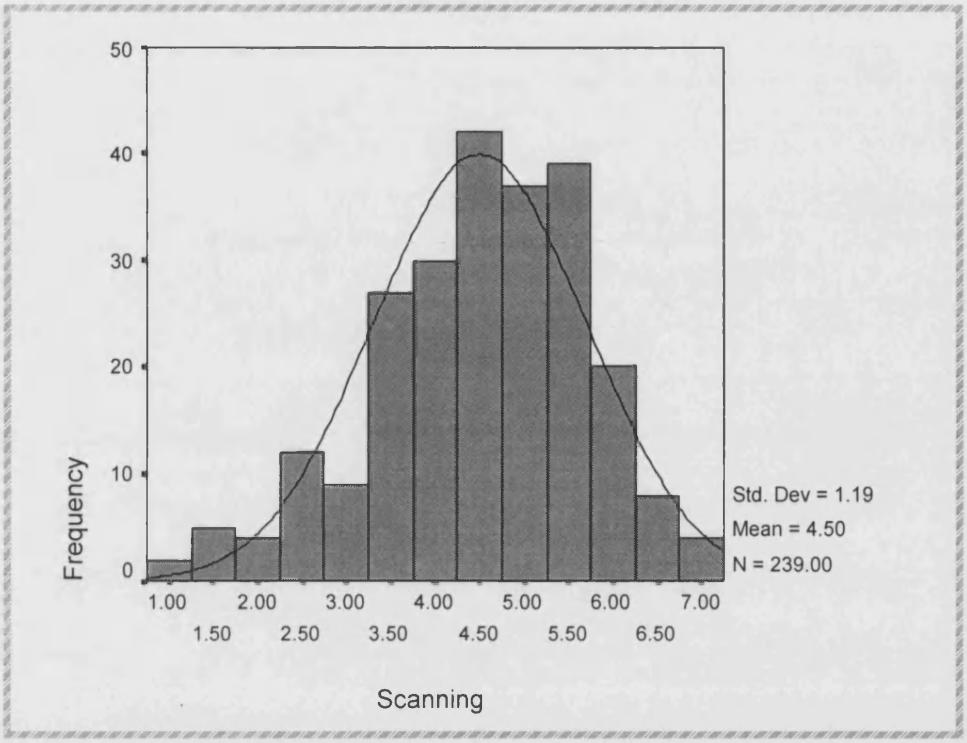


Factor analysis extracted two factors, the second factor consisting only of item number 4, a reversed score item concerning the extent to which decision-makers felt they needed to acquire more information for making the decision. The first factor, representing scanning intensity and breadth, has an eigenvalue of 3.67 and explains 46% of the variance.

Reliability analysis of the eight items points to the removal of item 4 from the scale, as the item correlates very poorly with the total (coefficient: .02) and Cronbach's alpha increases from .8 to .85 when the item is deleted.

The mean of the scale is 4.5, almost equal to the mean of organizational market information acquisition processes reported by Moorman (1995), at 4.7. The standard deviation is 1.2, while the distribution of the variable (Figure 6.16) is moderately negative (i.e., skewed to the right – skewness coefficient: -.5). The Kolmogorov-Smirnov test reveals that the variable does not deviate significantly from normality (K-S Z=1.35; p=. 06).

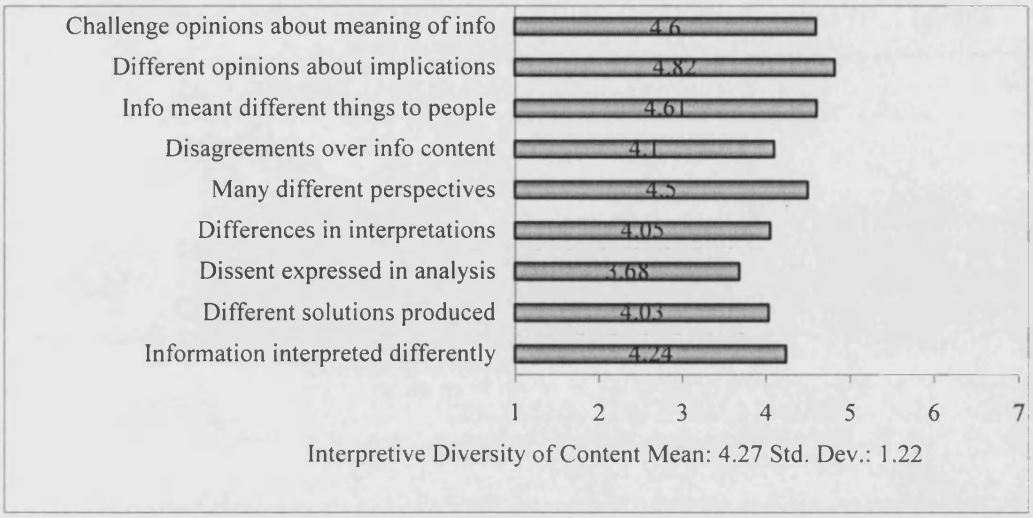
FIGURE 6.3.2: HISTOGRAM OF SCANNING



6.3.2 Interpretive Diversity: Content, Frame, and Unified Diversity

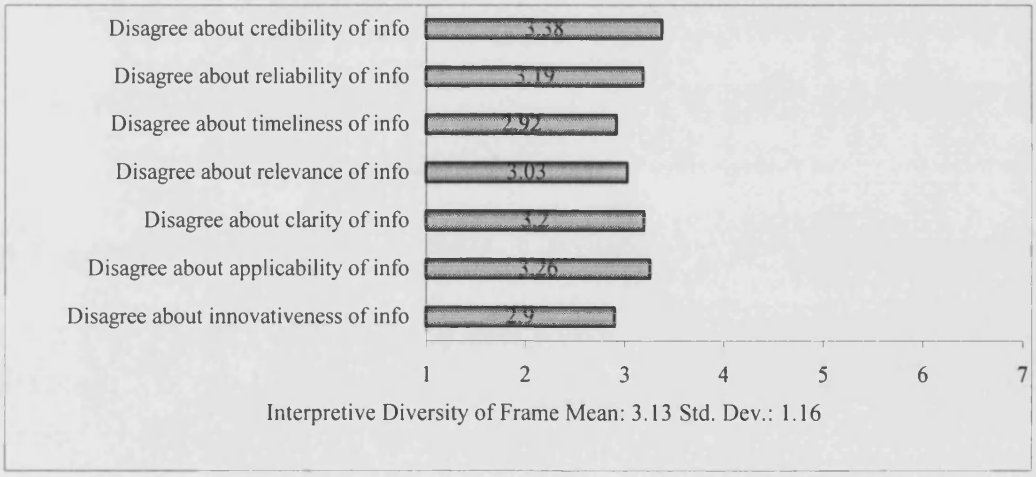
Interpretive diversity was measured along the two dimensions of content and frame. Interpretive diversity of frame was measured with nine items presented with their corresponding mean scores in Figure 6.3.3 The item averages vary from 3.68 to 4.82, while the mean score for the scale is 4.27, indicating a marginally above average tendency of decision-making groups in the sample to generate diverse interpretations of the content of market information. The distribution of the variable is normal (K-S Z= 1.08; p=.20), while the alpha for the interpretive diversity scale is .89.

FIGURE 6.3.3: MEAN RESPONSES TO INTERPRETIVE DIVERSITY OF CONTENT ITEMS



Interpretive diversity of frame was measured with the seven items presented in Figure 6.3.4. The averages of the items do not vary considerably, ranging from 2.9 to 3.38. The average of the scale is 3.13, noticeably lower compared to the content dimension. This suggests that overall there is a tendency for members of decision-making groups in the sample tend to agree in their assessment of the collected market information. The standard deviation of the scale is 1.16 and distribution of the variable does not depart significantly from normality (K-S Z=1.09; p=.19). The alpha for the scale is .89.

FIGURE 6.3.4: MEAN RESPONSES TO INTERPRETIVE DIVERSITY OF FRAME ITEMS



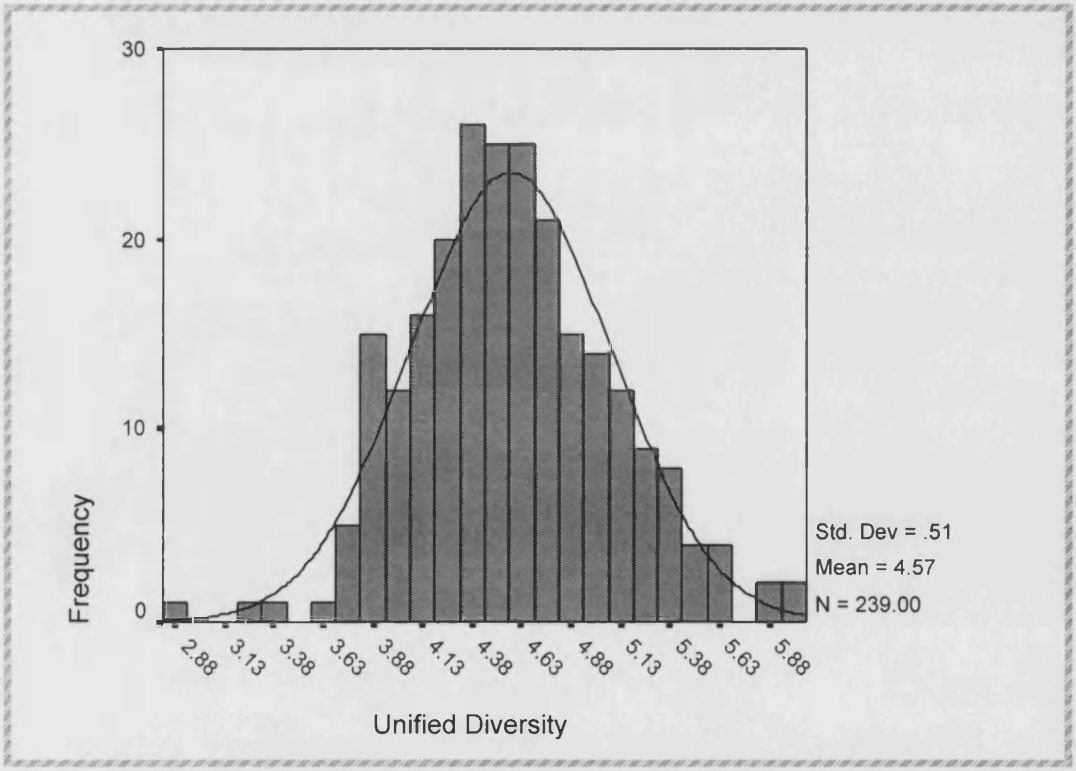
The 17 items measuring diversity of content and frame were subsequently subjected to principal components analysis. Two factors were extracted, confirming the two-dimensional structure of content and frame of the construct (Appendix III.4.B). Both factors have eigenvalues above 1 and together they account for 58% of the variance.

The interpretive diversity scale shows strong internal consistency, suggested by the high alpha coefficient (.92). Moreover, with the exception of item 5 on the content dimension that has a weaker correlation to the scale (.37), all other item-total coefficients are well above .5. Since the scale's alpha does not improve with deletion of item 5 and the loading of the item on the content factor is well above .5, the item was retained in the scale.

➢ **Unified Diversity**

In order to test the model hypotheses regarding the antecedents and outcomes of unified diversity (see chapter 3), a new variable needed to be constructed, which would reflect interpretive *diversity* of content and interpretive *consensus* of frame. For this reason, the seven items measuring interpretive diversity of frame were reversed to reflect consensus and subsequently added to interpretive content diversity, to create an index of unified diversity. The distribution of the new variable is presented in Figure 6.3.5 below. The mean of unified diversity is 4.6, with a standard deviation of .5. This suggests that on average decision-making groups in the sample generated an above average unified diversity for the reported decision. The distribution is positively skewed, but does not depart significantly from normality (K-S Z=.70; p=.72).

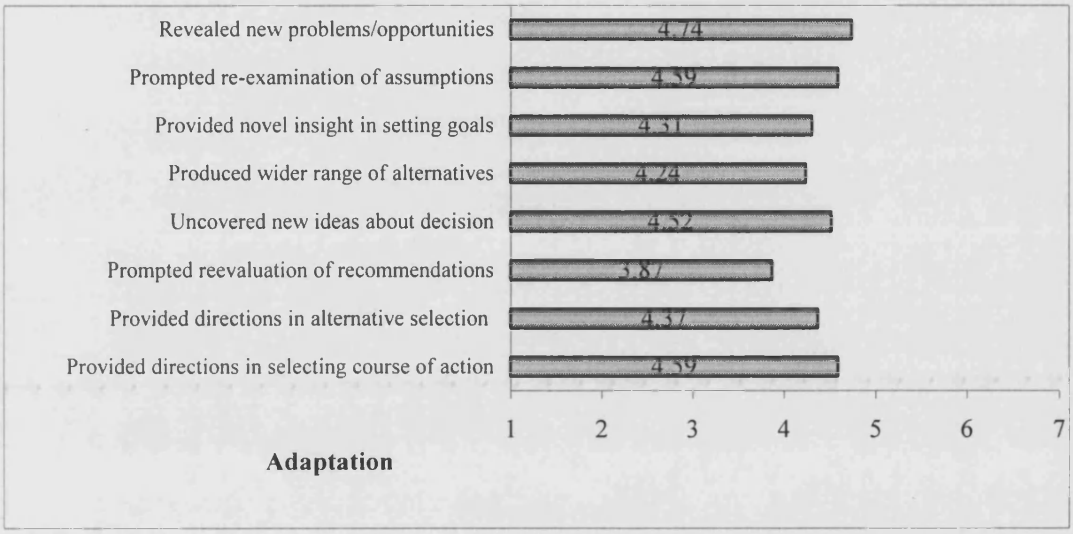
FIGURE 6.3.5: HISTOGRAM OF UNIFIED DIVERSITY



6.3.3 Adaptation

Adaptation was measured with eight items presented in Figure 6.3.6 below. Overall, the mean responses do not seem to vary noticeably between the eight items, ranging from a low of 3.87 for item 6 concerning the extent to which analysis prompted a reevaluation of recommendations, to a maximum of 4.74 for the first item, that concerns the degree to which information analysis revealed new problems or opportunities relating to the particular decision.

FIGURE 6.3.6: MEAN RESPONSES TO ADAPTATION ITEMS

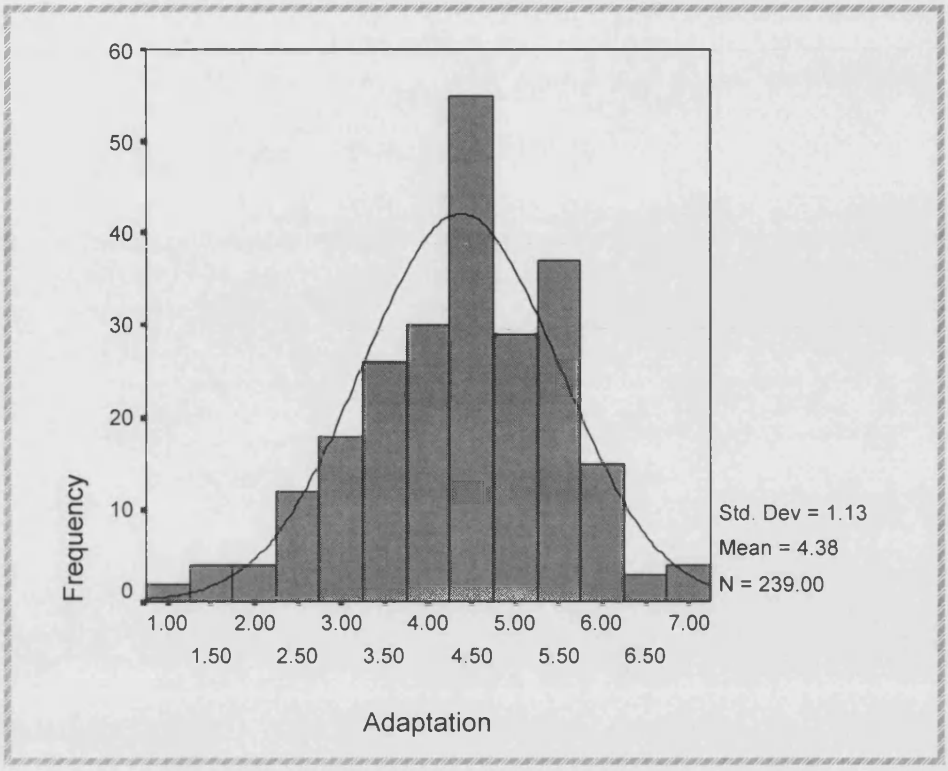


The principal components analysis extracted one factor, accounting for 50% of the variance. However, similarly to the pilot study, the last item on the scale loaded weakly on the factor (.4), even though the item was reworded for the main survey.

Reliability analysis of the eight items, revealed an internally consistent scale, with an alpha coefficient of .84. Moreover, the item-total correlation coefficients are all above .5, except for the last item (.31). Based on this, the last item was deleted from the scale, increasing Cronbach's alpha for the scale to .86.

The mean score for adaptation is 4.38 and the standard deviation is 1.13. The variable has a slight negative skew (-.4), but is confirmed as normal by the Kolmogorov-Smirnov coefficient. (K-S Z=1.03; p=.24).

FIGURE 6.3.7: HISTOGRAM OF ADAPTATION



6.3.4 Validity Assessment of the Learning Process Scales

Content validity of the three scales is established, given that the items in the scanning scale were taken from the literature and experts evaluated the items for interpretive diversity and adaptation for consistency with and representativeness of their theoretical definitions.

In order to assess the convergent validity of the interpretive diversity scale, the Pearson correlation coefficients were calculated between interpretive diversity and a conceptually similar construct, equivocality of information. As shown in Table 6.1 below, the expectation that information equivocality will be positively associated with interpretive diversity of content and frame is confirmed, attesting to the convergent validity of the interpretive diversity scale.

TABLE 6.1: CONVERGENT VALIDITY OF INTERPRETIVE DIVERSITY

	I.D. Frame	I.D. Content
I.D. Content (Sig.)	.639 (.000)	-
Equivocality (Sig.)	.368 (.000)	.400 (.000)

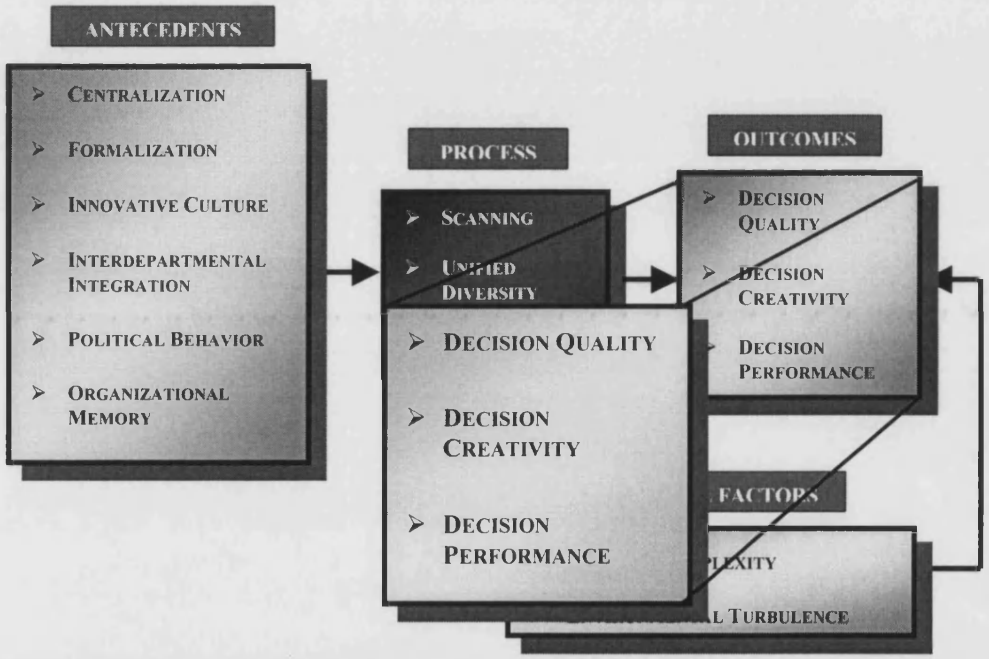
I.D.: Interpretive Diversity

As far as discriminant validity is concerned, all the items of the learning process were subjected to factor analysis, to ensure that the constructs are conceptually distinct. The results support discriminant validity for the three scales. Four clear factors were extracted, representing scanning, ID content, ID frame, and adaptation. The results are reported in Appendix III.4.B.

6.4 Decision Outcomes

This section concerns the initial data analysis of the decision effectiveness variables, presented in Figure 6.4 below:

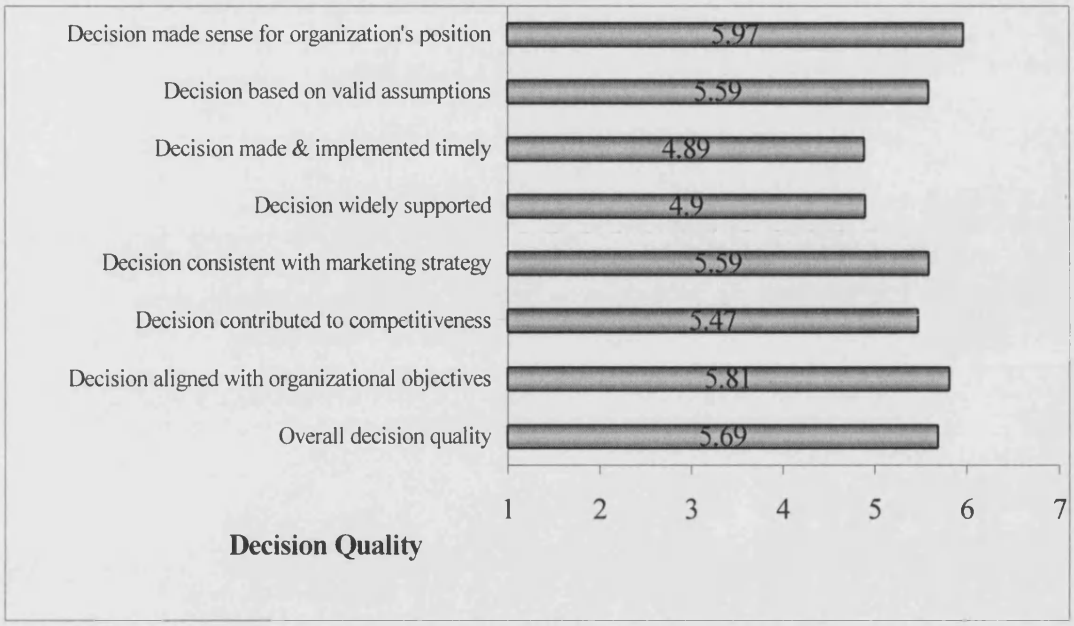
FIGURE 6.4: OUTCOME VARIABLES



6.4.1 Decision Quality

Decision quality was measured with the eight items presented in Figure 6.4.1 below. The average responses between the eight items do not vary considerably, but are all well above the scale middle point, ranging from 4.89 to as high as 5.97.

FIGURE 6.4.1: MEAN RESPONSES TO DECISION QUALITY ITEMS

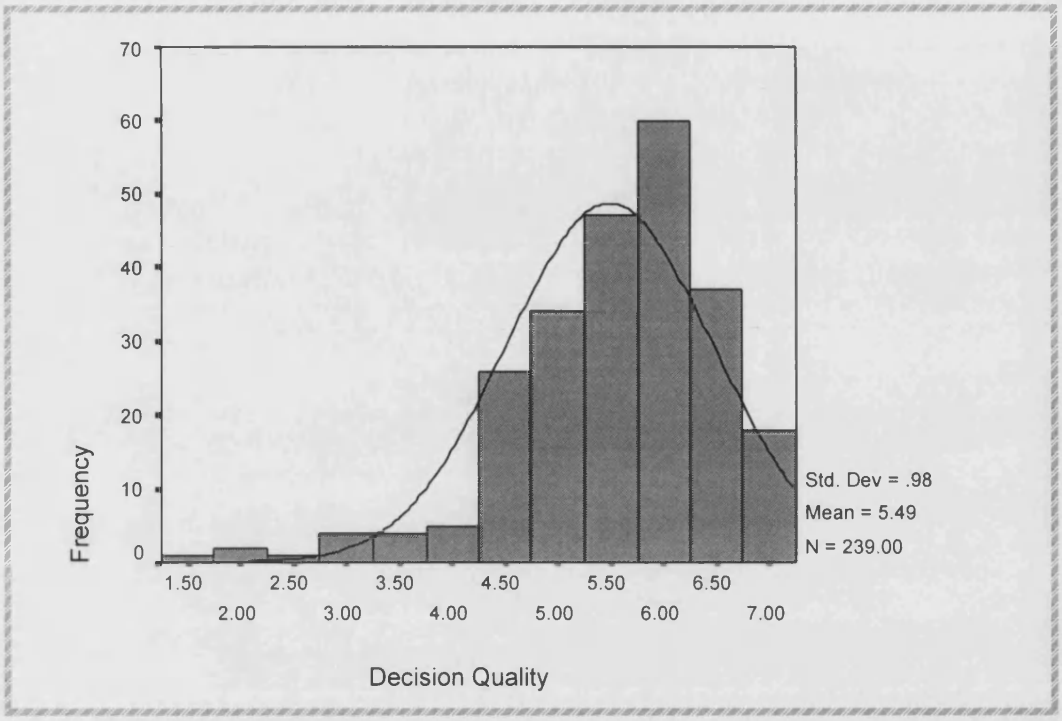


Factor analysis of the eight items confirmed the single factor structure of the decision quality construct, with one factor accounting for 55% of the variance.

Reliability analysis of the items suggests that the scale is internally consistent, the standardized item alpha being .88 and all the item-total correlation coefficients well above .5.

The distribution of the variable is presented in Figure 6.4.2 below. The scale has a mean of 5.5 with a standard deviation of .98. The distribution significantly departs from normality (K-S Z=1.65; p=.01) and is negatively skewed (skewness coefficient: -1.14). This finding is consistent however, with Dooley and Fryxell (1999), the only study with a similar scale of decision quality, who report a mean score of 6.02, with a standard deviation of .63, on a seven-point Likert type scale.

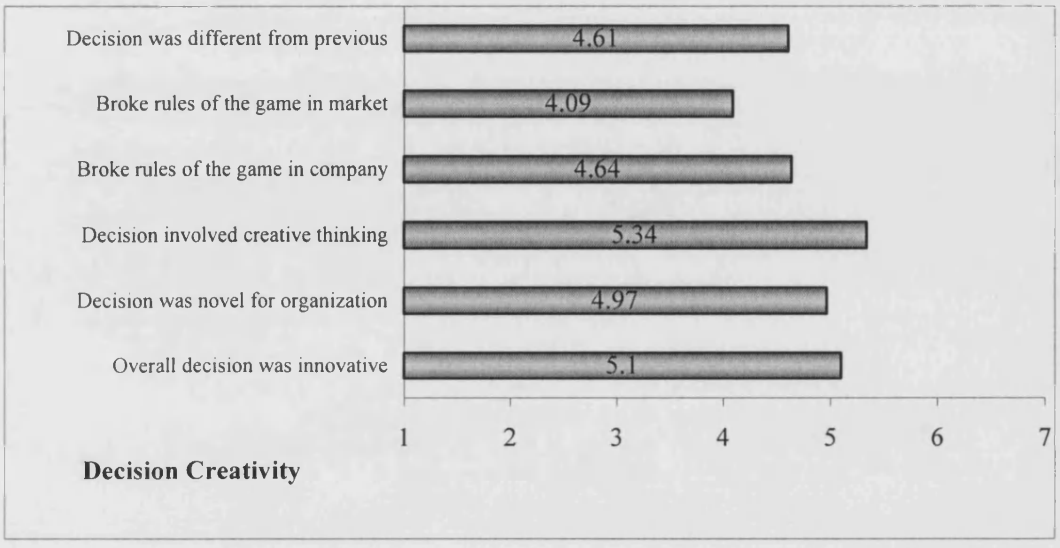
FIGURE 6.4.2: HISTOGRAM OF DECISION QUALITY



6.4.2 Decision Creativity

The mean scores of the six items measuring decision creativity are reported in Figure 6.4.3. All the averages of the responses are above the scale mid-point, ranging from a low of 4.09 for the item concerning the extent to which the decision broke the rules of the game in the market, to a maximum of 5.34 for the item concerning the level of creative thinking required for the decision.

FIGURE 6.4.3: MEAN RESPONSES TO DECISION CREATIVITY ITEMS

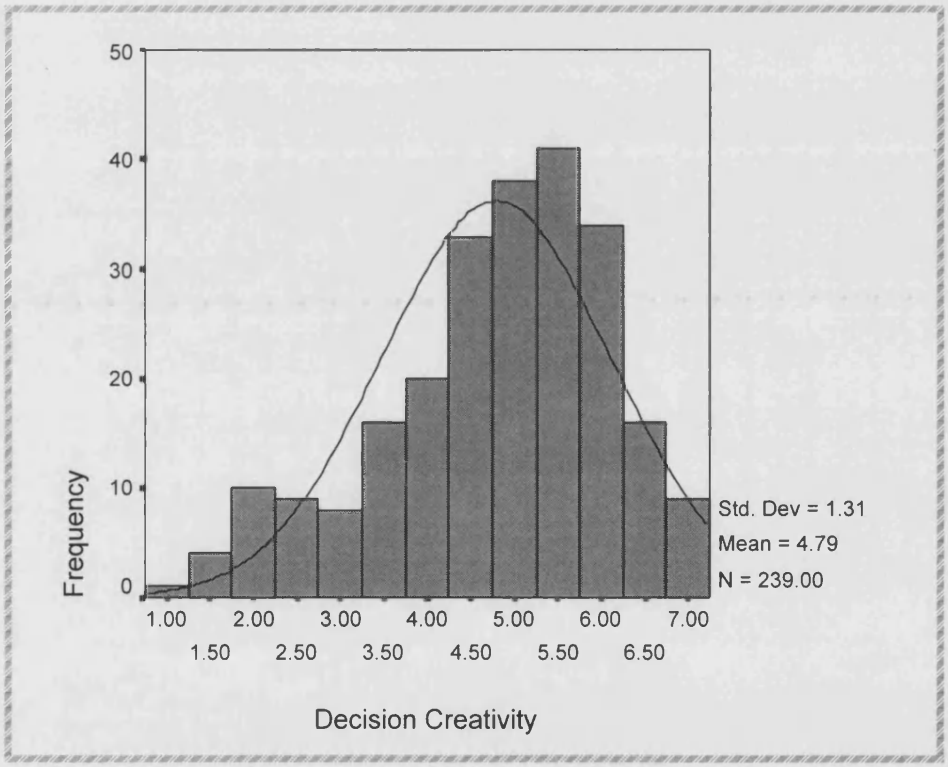


The factor analysis confirmed the single factor structure of the decision creativity construct. The extracted factor has an eigenvalue of 3.60 and explains 60.4% of the variance.

The scale is internally consistent as suggested by the high alpha coefficient, .87, while all the items have item-total correlation coefficients comfortably above .5.

The mean score of decision creativity is at 4.29 and the standard deviation is 1.3. The distribution of the variable, presented in Figure 6.4.4 below, is negatively skewed (skewness coefficient: -.64) and as in the case of decision quality departs somewhat from normality (S-K Z=1.52; p=.02).

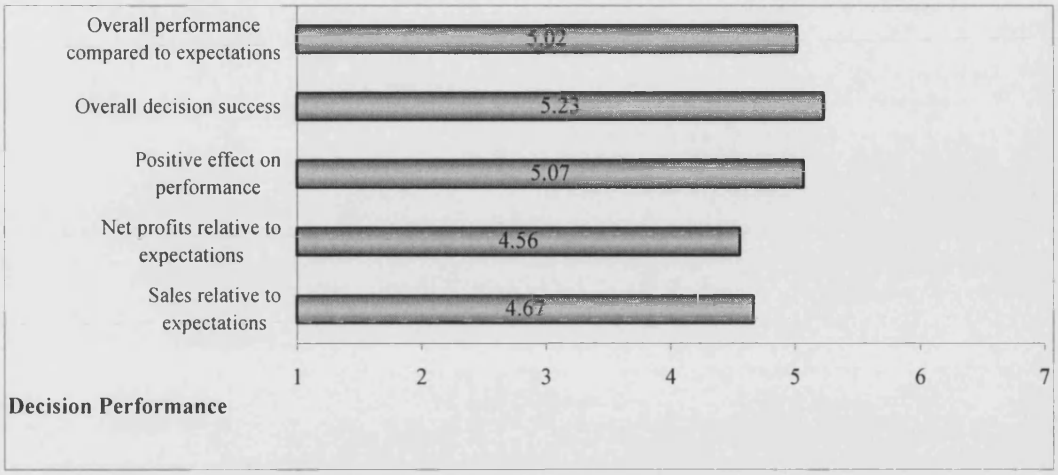
FIGURE 6.4.4: HISTOGRAM OF DECISION CREATIVITY



6.4.3 Decision Performance

Decision performance was measured with the five items presented in Figure 6.4.5 below. The averages of the items are all above the scale mid-point, while they don't range considerably between them.

FIGURE 6.4.5: MEAN RESPONSES TO DECISION PERFORMANCE ITEMS

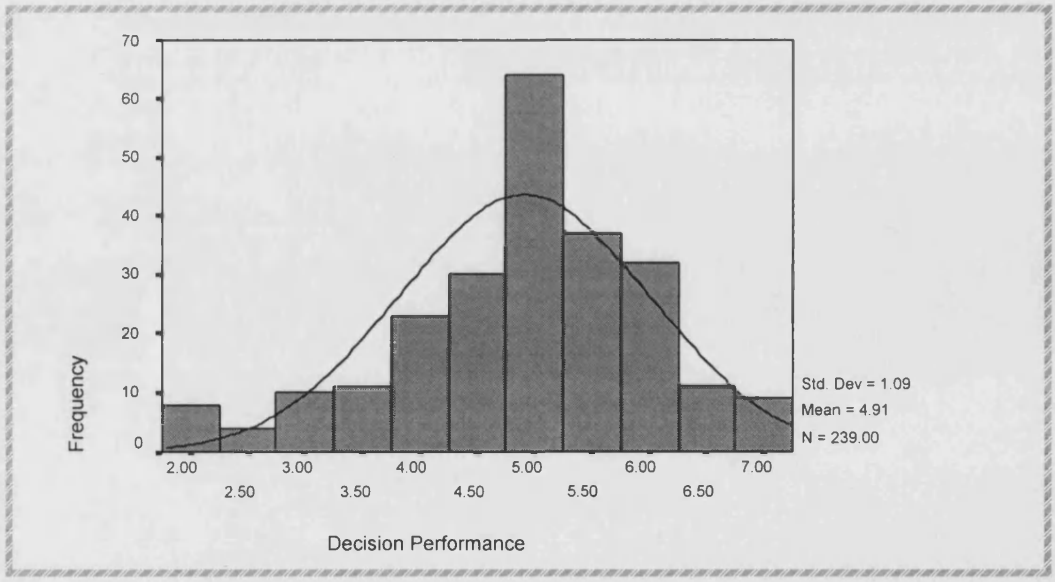


The factor analysis confirmed the predicted single factor structure for the decision performance construct. The extracted factor has an eigenvalue of 3.47 and explains 69% of the variance. All five items have strong loadings, i.e., above .76, on the factor.

The decision performance appears to be internally consistent, with Cronbach's alpha at .89 and strong item-total correlations.

The distribution of the variable is presented in Figure 6.4.6 below. The mean score is 4.91, with a standard deviation of 1.09; exceeding the scale middle point slightly more compared to the Menon et al. (1999) market performance scale average (3.5 on a five point scale). The distribution is negatively skewed (skewness coefficient: -.599) and departs from normality to a certain extent (K-S Z=1.55; p=.02).

FIGURE 6.4.6: HISTOGRAM OF DECISION PERFORMANCE



6.4.4 Validity Assessment of Decision Outcomes Scales

Evidence of face validity of the three decision outcomes scales are provided from both the literature as well as the experience survey with managers discussed in Chapter 4.

Assessment of convergent validity is attempted by looking at the Spearman correlation coefficients. The Spearman coefficients are calculated, because the normality condition is not met for any of the three variables (Silver 1992). Each decision outcome scale is validated against the other, the expectation being that the three measures of decision quality, decision creativity, and decision performance, will be positively related. As shown in Table 6.2 below, the significant positive correlations between the three summated scales attest to the scales' convergent validity.

TABLE 6.2: CONVERGENT VALIDITY OF DECISION OUTCOMES SCALES

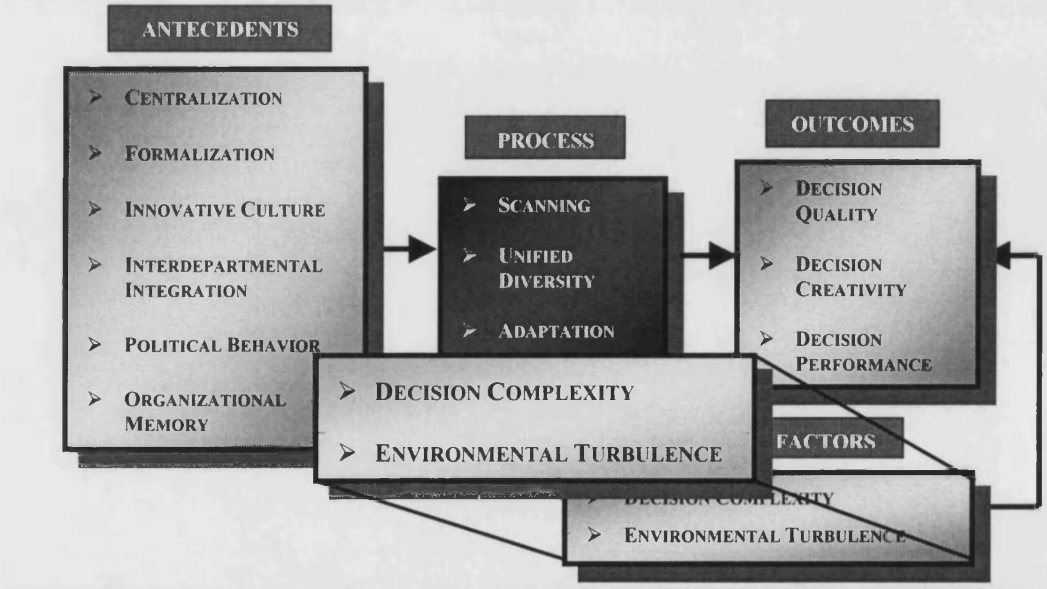
	Decision Performance	Decision Quality
Decision Performance (Sig.)	-	-
Decision Quality (Sig.)	.600 (.000)	-
Decision Creativity (Sig.)	.214 (.001)	.123 (.057)

Finally, discriminant validity was assessed by performing a factor analysis on all the decision outcomes items. All the items loaded on the three factors as expected, providing sufficient evidence for the scales' discriminant validity (Appendix III.4.C).

6.5 Control Factors

This section concerns the initial data analysis of the control variables, presented in Figure 6.5 below:

FIGURE 6.5: CONTROL VARIABLES

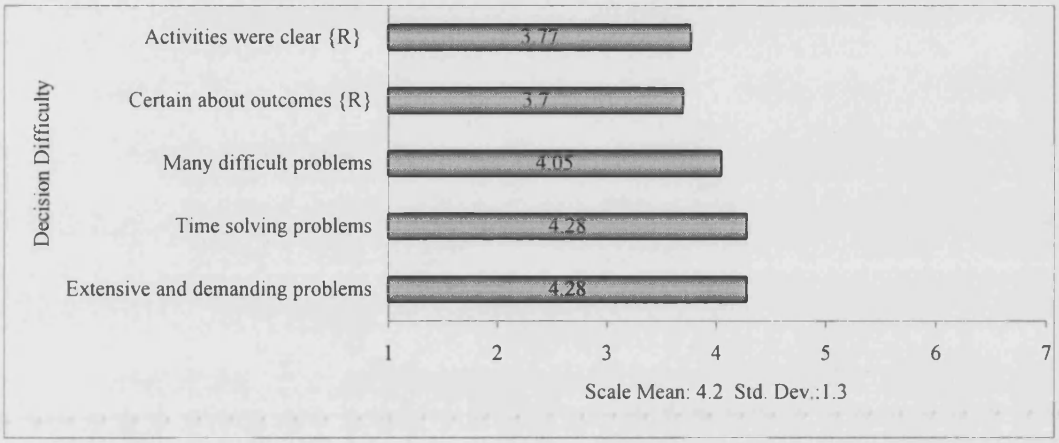


6.5.1 Decision Complexity: Difficulty and Variability

Respondents were also asked to assess the level of complexity that the strategic marketing decision entailed. Decision complexity was measured along the dimensions of difficulty and variability (e.g. Menon and Varadarajan 1992; Van de Ven and Ferry 1980).

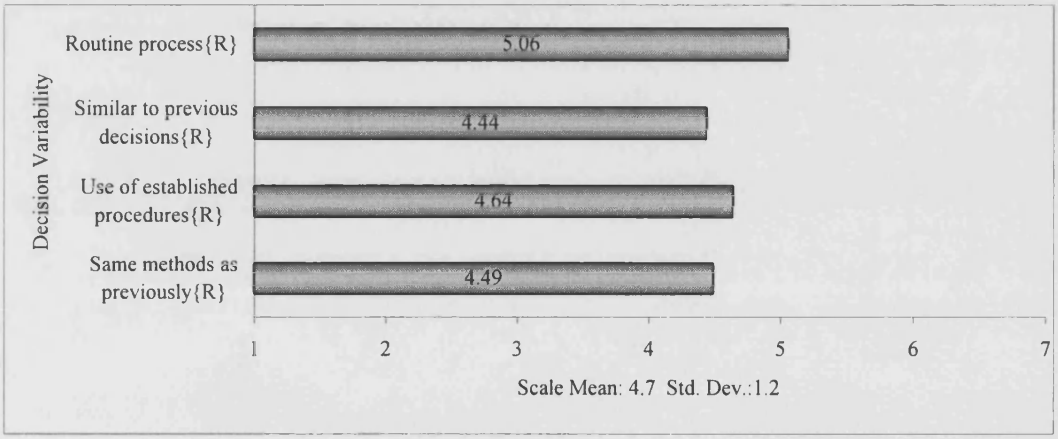
As shown in Figure 6.5.1, managers found the decisions of moderate difficulty. The mean for the difficulty dimension is 4.2, with a standard deviation of 1.3, while the averages between the five items do not vary significantly.

FIGURE 6.5.1: DECISION DIFFICULTY



As far as decision variability is concerned, managers again perceived decisions as moderately variable compared to previous or similar decisions. The average score is 4.7, while the only item that has a higher reported average (5.1), concerns the extent to which the process of making the decision was non-routine – which is consistent with the decisions being of a strategic nature. The standard deviation of the dimension is 1.2 (Figure 6.5.2).

FIGURE 6.5.2: DECISION VARIABILITY

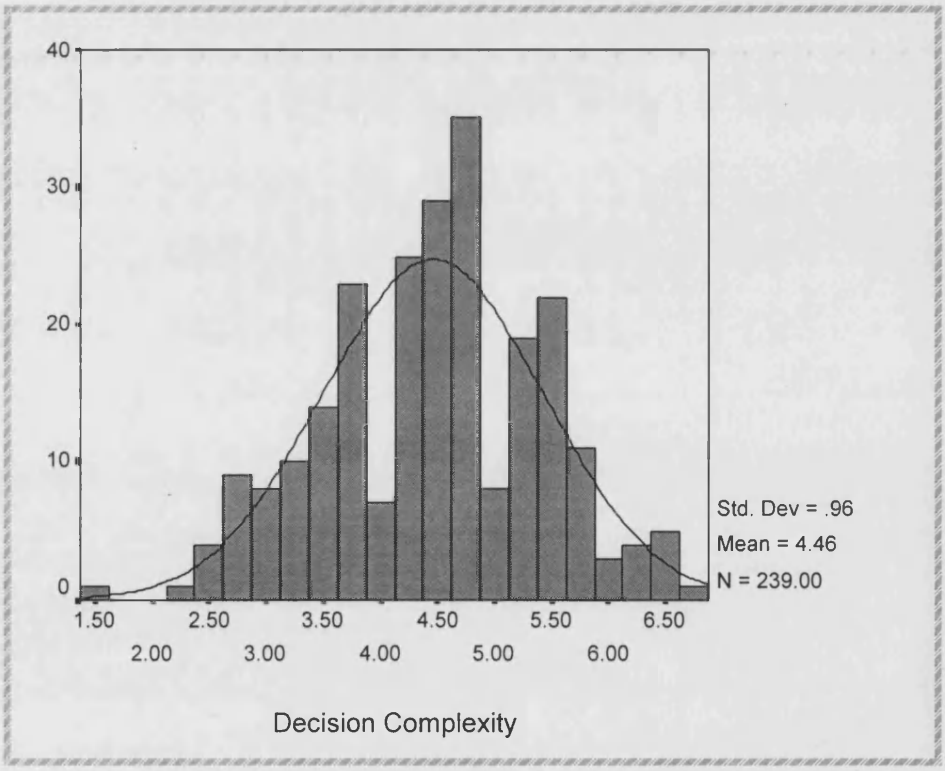


In order to assess the decision complexity scale dimensionality, the nine items were subjected to principal components analysis. Three factors were extracted from the analysis. The first factor is composed of the four decision variability items, as was anticipated. The decision difficulty items are divided into two factors, one with items 3, 4, and 5 and the other with the reversed score items 1 and 2.

The scale reliability for all nine items is at .72, however, is reduced to .68 when items 1 and 2 are removed from the scale. Although .68 is slightly lower than the .70 threshold proposed by Nunally (1978), it was deemed acceptable, given that according to Slater (1995) the "criterion in use" in about half of the papers published in marketing journals, tends to be closer .60 than to .70. Therefore, based on the factor and reliability analysis, the two reversed items were excluded from the analysis.

The mean of the decision complexity scale is 4.46 and the standard deviation just under 1. Figure 6.5.3 shows the distribution of the variable, which is confirmed as normal by the Kolmogorov-Smirnoff test (K-S Z=.92; p=.4).

FIGURE 6.5.3: HISTOGRAM OF DECISION COMPLEXITY

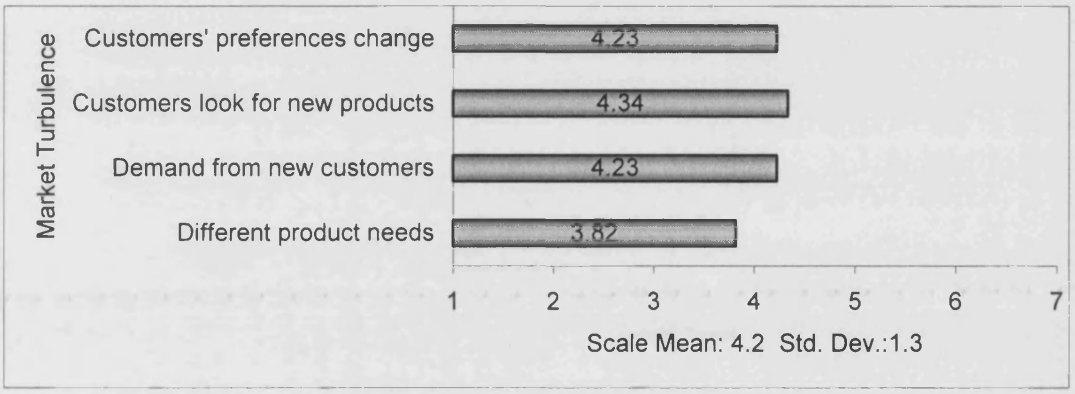


6.5.2 Environmental Turbulence: market turbulence, competitive intensity, and technological turbulence

Environmental turbulence is assessed in terms of (1) market turbulence, (2) competitive intensity, and (3) technological turbulence using an instrument adapted from Jaworski and Kohli (1993). First, the summaries of the items within each dimension are presented and secondly, the index reliability score and the factor structure are presented.

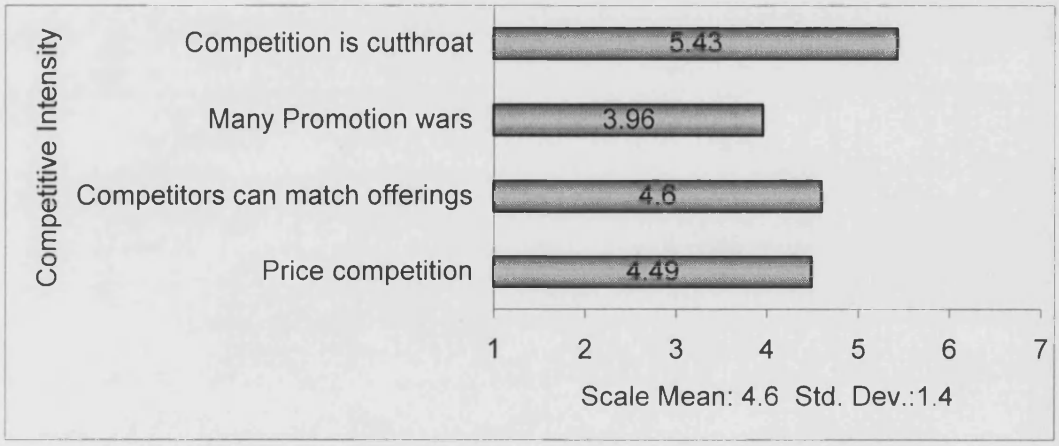
The mean for each item and summary statistics of the three scales are presented in Figures 6.5.4 to 6.5.6 The profile analysis of the market turbulence scale reveals a rather low variation between the averages of the four items. The mean score on the 7-point scale is 4.2 with a standard deviation of 1.3.

FIGURE 6.5.4: MEAN RESPONSES TO MARKET TURBULENCE SCALE



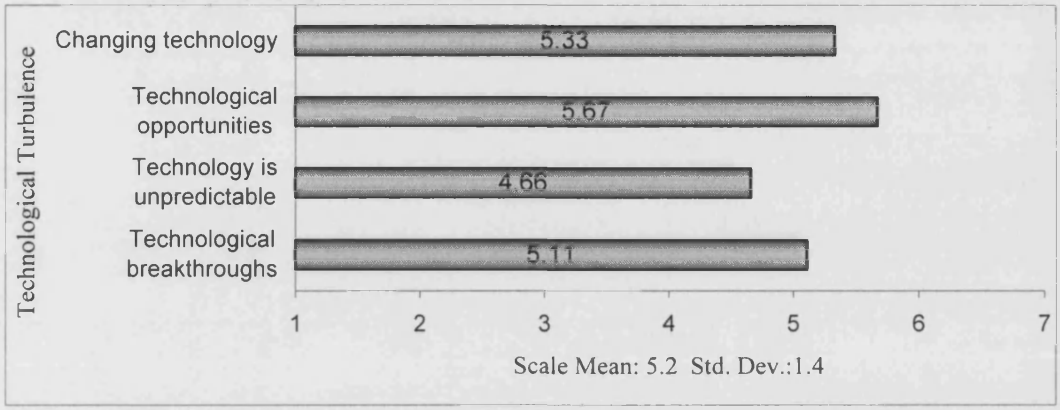
A higher variation in the means of the competitive intensity scale, particularly between the first (5.43) and the second (3.96) item, appears in Figure 6.5.5. The scale average is 4.6, with a standard deviation of 1.4.

FIGURE 6.5.5: MEAN RESPONSES TO COMPETITIVE INTENSITY SCALE



The average for the technological turbulence scale is quite higher compared to the two other scales, at 5.2, indicating that organizations in the sample experience greater pressures from changes in technology, rather than from customer or competitive turbulence. The item with the highest average (5.7) refers to the opportunities that technological developments have made possible in each industry. The standard deviation of the scale is 1.4.

FIGURE 6.5.6: MEAN RESPONSES TO TECHNOLOGICAL TURBULENCE SCALE

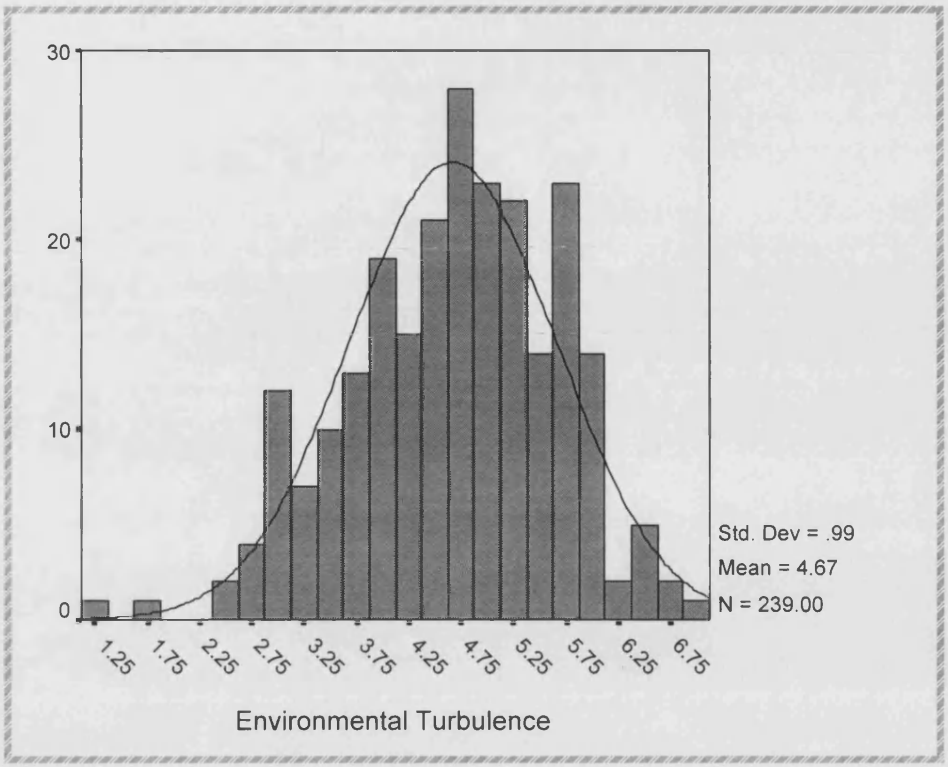


In order to create an index of environmental turbulence based upon the scales of Jaworski and Kohli (1993), the three scales' items were factor analyzed using a principal components procedure and the overall reliability of environmental turbulence was subsequently calculated.

The principal components analysis confirms the three-factor structure of environmental turbulence. The three dimensions of market turbulence, competitive intensity, and technological turbulence were constructed as anticipated, while the Cronbach's alpha for all twelve items is at .81 (Appendix III.4.D). Although the item-total correlations are relatively low, ranging from .25 to .63, it was decided to retain all of them, given that the overall scale alpha does not improve with the deletion of items. Hence, environmental turbulence is computed as the sum of the twelve items representing the three dimensions.

The mean score of the overall scale is 4.7, with a standard deviation of .99. The median, which is also equal to 4.7, signifies that the sample is equally split between organizations that experience high and low environmental turbulence. Figure 6.5.7 shows the distribution of the variable, which is also confirmed as being normal by the Kolmogorov-Smirnov test (K-S Z=.9; p=.4).

FIGURE 6.5.7: HISTOGRAM OF ENVIRONMENTAL TURBULENCE



6.5.3Validity Assessment Of Organizational Context Scales

As noted in the first section of this chapter, content validity of the control variables scales is acknowledged, because the two scales were taken directly from the literature. Discriminant validity was established by performing a factor analysis on all the items describing decision complexity and environmental turbulence. The results of the factor analysis on the items are presented in Appendix III.4.D. Five factors were extracted as expected, each factor representing a construct dimension (i.e., decision difficulty, decision variability, market turbulence, competitive intensity, and technological turbulence), while each factor has an eigenvalue comfortably over 1 and each item a loading well over .5. Therefore, discriminant validity of the control variables scales is satisfied.

6.6 Relationships Between Model Variables

In addition to the measures that summarize the distributions of single variables and assess the scales' psychometric properties, it is important to consider the measures of association that summarize the relationships between variables before performing the

confirmatory statistical analysis. Estimating the correlation coefficients allows assessment of the strength and direction of the relationship between variables and may be employed to provide evidence of nomological validity of the scales. According to Churchill (1991), nomological validity concerns whether "*the construct behaves as expected with respect to the other constructs to which it is theoretically related*" (p. 492). Hence, by assessing the correlation between variable scales that according to the literature are related, the nomological aspect of construct validity is ascertained.

The correlations reported in Table 6.3, concern the relationships between organizational context and the learning process and are derived from the literature review and hypotheses presented in Chapter 3. Both the expected relationships and the actual correlations are presented in the tables. A one-tailed significance was applied, as the directions of the linkages were expected.

TABLE 6.3: CORRELATIONS BETWEEN ORGANIZATIONAL CONTEXT AND LEARNING PROCESS

Organizational Context		Scanning	Unified Diversity	Adaptation
Centralization	Expected Relationship	Negative (H1a)	Negative (H1b)	Negative (H1c)
	Pearson Correlation	-.266**	-.169**	-.140*
	Sig. (1-tailed)	.000	.004	.015
Formalization	Expected Relationship	Positive (H2a)	Positive (H2b)	Negative (H2c)
	Pearson Correlation	.220**	.125*	.093
	Sig. (1-tailed)	.000	.027	.076
Innovative Culture	Expected Relationship	Positive (H3a)	Positive (H3b)	Positive (H3c)
	Pearson Correlation	.216**	.211**	.201**
	Sig. (1-tailed)	.000	.001	.001
Interdepartmental Integration	Expected Relationship	Positive (H4a)	Positive (H4b)	Positive (H4c)
	Pearson Correlation	.421**	.287**	.266**
	Sig. (1-tailed)	.000	.000	.000
Political Behavior	Expected Relationship	Negative (H5a)	Negative (H5b)	Negative (H5c)
	Pearson Correlation	-.003	.073	.121*
	Sig. (1-tailed)	.483	.131	.031
Organizational Memory	Expected Relationship	Positive (H6a)	Positive (H6b)	Positive (H6c)
	Pearson Correlation	.169**	.017	.029
	Sig. (1-tailed)	.004	.394	.326
	N	239	239	239

** Correlation is significant at the 0.01 level (1-tailed).
* Correlation is significant at the 0.05 level (1-tailed).

As shown in Table 6.3, out of the 18 anticipated linkages, 12 are statistically significant in the expected direction, while one (the relationship between political behavior and adaptation) is significant at the opposite direction. Given the relatively limited empirical evidence on the hypothesized relationships between organizational context and the learning process variables, it may be proposed that there is enough support for accepting that the scales are nomologically valid.

Concerning decision outcomes, the correlations with the learning process variables and the anticipated relationships derived from theory are presented in Table 6.4 below. Given that the distributions of the decision outcomes variables were found to depart significantly from normality, Spearman correlations were employed. Again a one-tailed significance was applied, as the directions of the relationships were all expected, except for the control variables of decision complexity and environmental turbulence, where a two-tailed significance was employed, as no formal hypotheses were developed.

TABLE 6.4: CORRELATIONS BETWEEN THE LEARNING PROCESS AND DECISION OUTCOMES

Learning Process		Decision Performance	Decision Quality	Decision Creativity
Scanning	Expected Relationship	Positive (H7a)	Positive (H7b)	Positive (H7c)
	Spearman Correlation	.377**	.371**	.322**
	Sig. (1-tailed)	.000	.000	.000
Unified Diversity	Expected Relationship	Positive (H8a)	Positive (H8b)	Positive (H8c)
	Spearman Correlation	.172**	.201**	.254**
	Sig. (1-tailed)	.004	.001	.000
Adaptation	Expected Relationship	Positive (H9a)	Positive (H9b)	Positive (H9c)
	Spearman Correlation	.045	.065	.313**
	Sig. (1-tailed)	.245	.159	.000
Decision Complexity	Expected Relationship	-	-	-
	Spearman Correlation	-.099	-.048	.433**
	Sig. (2-tailed)	.126	.462	.000
Environmental Turbulence	Expected Relationship	-	-	-
	Spearman Correlation	.047	.010	.240**
	Sig. (2-tailed)	.468	.873	000
	N	239	239	239

** Correlation is significant at the 0.01 level.
* Correlation is significant at the 0.05 level.

Out of the 9 anticipated relationships, 7 were found to be significant at $p<.01$. These results suggest that the decision outcomes measures may be considered nomologically valid.

Overall, with reference to scale validation, it can be concluded that the measures of the organizational context, learning process, and decision outcomes variables may be considered content valid and show sufficient evidence of convergent, discriminant, and nomological validity.

6.7 Synopsis

The data have been now analyzed both in terms of their nature, structure, and quality, as well as in terms of descriptive measures. Moreover, the psychometric properties of the scales have been assessed and the anticipated relationships between the model variables have been explored. Overall, the initial analysis suggests that conditions are met and that the assumptions of the subsequent statistical tests are likely to be satisfied, meaning that it is possible to proceed with confidence to the confirmatory phase of the analysis. In the next chapter, the model hypotheses are tested and the results are discussed.

CHAPTER 7

CONFIRMATORY ANALYSIS

CHAPTER 7

CONFIRMATORY ANALYSIS

"Probable impossibilities are to be preferred to improbable possibilities."

Aristotle
Posterior Analytics (350 B.C.)

In this chapter the confirmatory statistical analysis is undertaken. The hypotheses from Chapter 3, linking organizational context to the learning process and decision outcomes, are tested and the results are presented. The chapter is divided into three main sections. The first section presents the theoretical approach followed for testing the model. The second section deals with the analysis of variance of the three learning process variables and the third section deals with the analysis of variance of the three decision outcomes variables.

7.1 General Theory Approach

Given the nature of the problem, i.e., explanation of variation in each quantitative variable by mapping its relationship to a specific set of independent variables as an additive linear function, multiple regression analysis was considered an appropriate statistical tool. A series of multiple regressions can provide a means of objectively assessing the degree and character of the relationship between each dependent measure and the corresponding independent variables by enabling to:

(1) Determine the relative importance of each independent variable in the prediction of each dependent measure.
(2) Assess the nature of the relationships between the independent variables and each dependent measure.
(3) Gain insight into the relationships among independent variables in their prediction of each dependent measure (Hair et al. 1998).

Six multiple regressions were estimated to test the theoretical model, making up two different models presented in Figures 7.1 and 7.2 respectively. Each dependent variable representing the learning process, i.e., scanning, unified diversity, and adaptation, was regressed on the six independent variables representing organizational

context, while each of the three dependent variables representing decision outcomes was regressed on the three independent variables representing the learning process. Since all the independent variables were attributed equal importance, based on theoretical considerations, they were entered as single blocks. A significance level of p = .05 was chosen for the F statistic, as a limit above which the overall test is considered significant. Moreover, in the regression results the adjusted R^2 rather than the R^2 is discussed, although both values are reported, as *"the adjusted R^2 value is particularly useful in comparing across regression equations involving different numbers of predictors or different sample sizes because it makes allowances for the specific number of predictors and sample size upon which each model is based"* (Hair et al. 1998: 182). In addition, although both standardized and unstandardized beta coefficients are reported, particular attention is paid to the standardized coefficients, because they allow for *"a direct comparison between coefficients as to their relative explanatory power of the dependent variable"* (Hair et al. 1998: 188).

Before the estimated regression equations are presented and the results interpreted, the assumptions pertaining to multiple linear regressions need to be checked (e.g. Hair et al. 1998). The assumptions tested for each regression equation are linearity, variance of error term, normality, and multicolinearity. These are discussed briefly below.

➢ **Linearity**

The linearity of the relationship between the dependent and independent variables represents the extent to which the change in the dependent variable is associated with the independent variable (Hair et al. 1998). The concept of linearity is important because correlations represent only linear associations between variables, meaning that any non-linear effects will not be represented in the correlation values, which can result in an underestimation of the actual strength of the relationship between the dependent and the independent variables. Following Hair et al. (1998), linearity is examined through residual plots.

➢ **Constant Variance of the Error Term**

Homoscedasticity concerns the assumption that the dependent variable exhibits equal levels of variance across the range of independent variables. According to Hair et al. (1998), *"homoscedasticity is desirable because the variance of the dependent variable*

being explained in the dependence relationship should not be concentrated in only a limited range of the independent values" (p. 73). Diagnosis of heteroscedasticity, i.e., the presence of unequal variances, is made by plotting the studentized residuals against the predicted dependent values and inspecting the resulting pattern (Hair et al. 1998).

➢ **Normality**

Normality, in a multivariate sense, refers to the extent to which the shape of the data distribution for each individual variable corresponds to the normal distribution and that their combination is also normal. This assumption is important because if the variation from a normal distribution is sufficiently large, the resulting statistical tests are invalid, given that normality is required to use the F and t statistics (Hair et al. 1998). Although univariate normality can help achieve multivariate normality, it does not guarantee it, meaning that multivariate normality should be diagnosed on its own merit. For this purpose, following Hair et al.'s (1998) recommendations, two graphical methods are employed: (1) histograms of the studentized residuals and (2) normal probability plots.

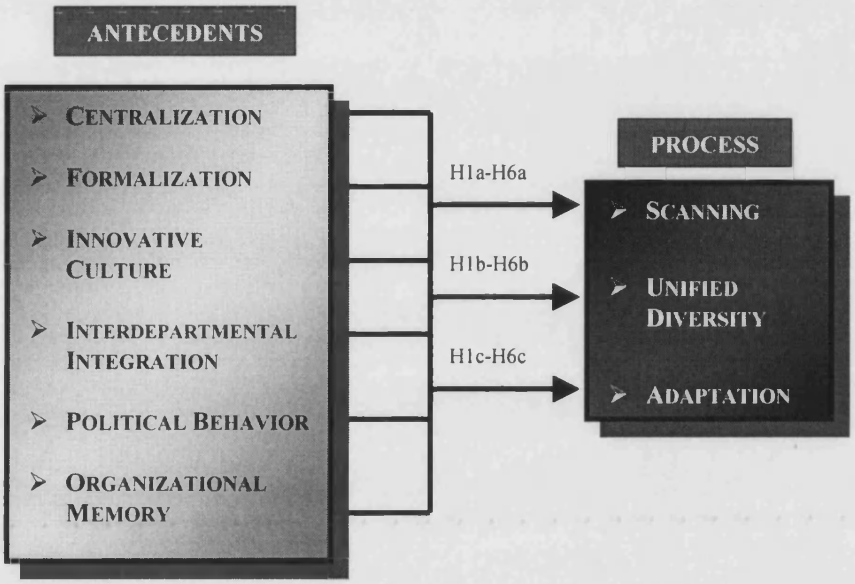
➢ **Multicollinearity**

Multicollinearity concerns the independence of the predictor variables in the model. This is a problem concerning the data rather the model specification and it impacts (1) the ability of the regression procedure and the researcher to represent and explain the effects of each independent variable in the regression variate and (2) the estimation of the regression coefficients and their statistical significance tests (Hair et al. 1998). Assessment of multicollinearity is typically undertaken by first examining the correlation matrices of the predictor variables of each regression equation and second, by calculating the tolerance value, i.e., the amount of variability of each independent variable in an equation not explained by the other independent variables (e.g. Hair et al. 1998).

7.2 Analysis of Variance of the Learning Sub-Processes

The regression model pertaining to the three learning sub-processes, i.e., scanning, unified diversity, and adaptation with the corresponding hypotheses from Chapter 3 is presented in Figure 7.1 below.

FIGURE 7.1: LEARNING PROCESS REGRESSION MODEL



The three resulting regression equations can be expressed as follows:

(1) $Scanning = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + \varepsilon$;

(2) $UnifiedDiversity = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + \varepsilon$;

(3) $Adaptation = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + b_6x_6 + \varepsilon$,

where x_1 = centralization, x_2 = formalization, x_3 = innovative culture, x_4 = interdepartmental integration, x_5 = political behavior, x_6 = organizational memory, and ε = error term.

7.2.1 Checking the Assumptions of Multiple Regression

- **Linearity**

In order to assess the linearity of the relationship between each of the three dependent variables and the respective independent variables, residual plots were employed.

Specifically, for each regression equation the predicted values of the depended variables were plotted against the studentized residuals values. According to Hair et al. (1998), studentized residuals limit the effects of individual outliers, therefore allowing their retention in the equations, and are the most widely used form of standardized residuals. The three plots, presented in Appendix III.5.A, demonstrate no evidence of non-linearity, as no specific patterns (e.g., curvilinear) emerge from the plots, thus ensuring that the three equations are linear.

➢ **Heteroscedasticity**

Analysis of the constancy of residuals across values of the independent variables was performed also through the three scatterplots of studentized residuals. No severe violations of the heteroscedasticity assumption are observed, given that the three plots show no pattern of increasing or decreasing residuals and the patterns appear to be close, in shape, to the null point, as described by Hair et al. (1998). (The plot with unified diversity as the dependent variable shows a slight deviation of the plotted data towards the right of the graph. However, it is only when the data show very obvious and significant deviations from homogeneity that variance heteroscedasticity must be considered (Kleinbaum, Kupper, and Müller 1988)). Overall, the data exhibits very little evidence to reject homogeneity of the error term variances.

➢ **Normality**

In order to check for normality of the each regression residuals two graphical methods were employed: (1) the histograms of the studentized residuals (Appendix III.5.A) and the normal probability plots (Appendix III.5.A). For all three learning sub-processes the assumption of normality does not appear to be violated, since (1) the histograms show near normal distributions of the studentized residuals and (2) the studentized residuals plotted on the normal probability plots follow reasonably closely the line of the normal distribution. Therefore, normality of the error term of the variate is fairly satisfied for the three regression equations.

➢ **Multicollinearity**

With reference to the independence of the predictor variables, the correlations of the organizational context variables and variance inflation factors (VIF) for the equations

were calculated. The correlation matrix (Appendix III.5.C) does not reveal any correlation coefficients larger than .56. Since the accepted criterion for multicollinearity is a coefficient greater than .90 (Hair et al. 1998), the first check in assessing independence of predictor variables appears to be satisfied.

The tolerance values and the corresponding VIFs were calculated for each predictor variable and are reported in Tables 7.1 to 7.3. All the tolerance values are large (i.e., relatively close to 1, the lowest being .55), with the corresponding VIFs relatively low (the highest being 1.82), providing further evidence to suggest that multicollinearity is not present in the three regression equations.

7.2.2 Estimating the Regressions

Three standard linear multiple regression equations were estimated. Each dependent variable, i.e., scanning, unified diversity, and adaptation, was regressed on the six independent variables representing organizational context.

➢ Scanning

The results of the first regression equation, with scanning as the dependent variable are presented in Table 7.1 below.

TABLE 7.1: MULTIPLE REGRESSION RESULTS FOR SCANNING

Multiple R	.489				
R^2	.239				
Adjusted R^2	.219				
Standard Error	1.0535				
ANALYSIS OF VARIANCE					
	Sum of Squares	**DF**	**Mean Square**	**F**	**Sig.**
Regression	80.813	6	13.469	12.136	.000
Residual	257.481	232	1.110		
Total	338.294	238			

VARIABLES IN THE EQUATION	UNSTANDARDIZED COEFFICIENTS		STANDRD. COEFICNTS.			COLLINEARITY STATISTICS	
	B	**SEB**	**Beta**	**t-value**	**Sig.-t**	**Tol.**	**VIF**
Constant	1.407	.692		2.034	.043		
Centralization	-9.540	.077	-.095	-1.232	.219	.548	1.824
Formalization	**.166**	**.050**	**.198**	**3.349**	**.001**	.934	1.070
Innovative Culture	4.345	.059	.052	.738	.461	.649	1.541
Interdepartmental Integration	**.418**	**.083**	**.361**	**5.007**	**.000**	.632	1.582
Political Behavior	**.103**	**.054**	**.123**	**1.903**	**.058**	**.787**	**1.270**
Organizational Memory	3.781	.054	.042	.694	.488	.907	1.103

Based on the above, the following can be inferred regarding the impact of the six organizational context variables on the scanning process:

1. The F sig. is less than .05, suggesting that the model has explanatory value.
2. In examining the individual t-statistics, it is revealed that three variables, i.e., formalization of structure, interdepartmental integration, and political behavior are statistically significant.
3. The positive signs and the magnitudes of the beta coefficients are meaningful and in line with the theory for formalization and integration, with the exception of political behavior.
4. Interdepartmental integration has the strongest impact on scanning, followed by formalization, while political behavior has a relatively weak effect.
5. The adjusted R^2 suggests that the three variables explain 21.9% of the variation in scanning processes.

➢ **Unified Diversity**

Unified diversity was also regressed on the six organizational context variables. The results of the analysis are presented in Table 7.2 below.

TABLE 7.2: MULTIPLE REGRESSION RESULTS FOR UNIFIED DIVERSITY

Multiple R	.378						
R^2	.143						
Adjusted R^2	.121						
Standard Error	.4744						
ANALYSIS OF VARIANCE							
	Sum of Squares	**DF**	**Mean Square**	**F**	**Sig.**		
Regression	8.702	6	1.450	6.444	.000		
Residual	52.212	232	.225				
Total	60.914	238					
VARIABLES IN THE EQUATION	**UNSTANDARDIZED COEFFICIENTS**		**STANDRD. COEFFINTS.**			**COLLINEARITY STATISTICS**	
	B	**SEB**	**Beta**	**t-value**	**Sig.-t**	**Tol.**	**VIF**
Constant	3.464	.311		11.122	.000		
Centralization	-1.994	.035	-.047	-.572	.568	.548	1.824
Formalization	**4.608**	**.022**	**.130**	**2.061**	**.040**	.934	1.070
Innovative Culture	**6.015**	**.027**	**.171**	**2.269**	**.024**	.649	1.541
Interdepartmental Integration	**.120**	**.038**	**.244**	**3.192**	**.002**	.632	1.582
Political Behavior	**6.880**	**.024**	**.194**	**2.832**	**.005**	.787	1.270
Organizational Memory	-3.386	.025	-.088	-1.381	.169	.907	1.103

Based on the above, the following can be inferred regarding the impact of the six organizational context variables on unified diversity:

1. The F sig. is less than .05, suggesting that the model has explanatory value.
2. In examining the individual t-statistics, it is revealed that four out of the six variables, i.e., formalization, innovative culture, interdepartmental integration, and political behavior, are statistically significant.
3. The positive signs and the magnitudes of the beta coefficients are meaningful and in line with the theory for all four variables, except for political behavior that was hypothesized to have a negative effect.

4. Interdepartmental integration has the strongest impact on unified diversity, followed in turn by political behavior, innovative culture, and formalization of structure.
5. The adjusted R^2 suggests that these four variables explain 12.1% of the variation in unified diversity.

➢ Adaptation

The last learning sub-process, adaptation, was also regressed on the predictor organizational context variables. The regression results are reported below:

TABLE 7.3: MULTIPLE REGRESSION RESULTS FOR ADAPTATION

Multiple R	.373						
R^2	.139						
Adjusted R^2	.117						
Standard Error	1.0642						
ANALYSIS OF VARIANCE							
	Sum of Squares	**DF**	**Mean Square**	**F**	**Sig.**		
Regression	42.414	6	7.069	6.242	.000		
Residual	262.758	232	1.133				
Total	305.173	8					
VARIABLES IN THE EQUATION	**UNSTANDARDIZED COEFFICIENTS**		**STANDRD. COEFFINTS.**			**COLLINEARITY STATISTICS**	
	B	**SEB**	**Beta**	**t-value**	**Sig.-t**	**Tol.**	**VIF**
Constant	1.750	.699		2.504	.013		
Centralization	-3.031	.078	-.032	-.387	.699	.548	1.824
Formalization	6.932	.050	.087	1.382	.168	.934	1.070
Innovative Culture	**.143**	**.059**	**.182**	**2.410**	**.017**	.649	1.541
Interdepartmental Integration	**.258**	**.084**	**.235**	**3.064**	**.002**	.632	1.582
Political Behavior	**.193**	**.054**	**.243**	**3.544**	**.000**	.787	1.270
Organizational Memory	-5.567	.055	-.065	-1.012	.313	.907	1.103

Based on the above, the following can be inferred regarding the impact of the six organizational context variables on adaptation:

1. The F sig. is less than .05, suggesting that the model has explanatory value.
2. In examining the individual t-statistics, it is revealed that three out of the six variables, i.e., innovative culture, interdepartmental integration, and political behavior, are statistically significant.
3. The positive signs and the magnitudes of the beta coefficients are meaningful and in line with the theory for all four variables, except for political behavior that was hypothesized to have a negative effect.
4. Interdepartmental integration has the strongest impact on adaptation followed by political behavior and innovative culture.
5. The adjusted R^2 suggests that the three variables explain 11.7% of the variation in adaptation.

7.2.3 Summary of Hypotheses and Results

The findings of the regression equations concerning the learning process antecedents are summarized in Table 7.4 below. Overall, out of 18 hypotheses, 10 were supported by the findings.

TABLE 7.4: SUMMARY OF HYPOTHESES AND RESULTS OF THE LEARNING PROCESS ANTECEDENTS

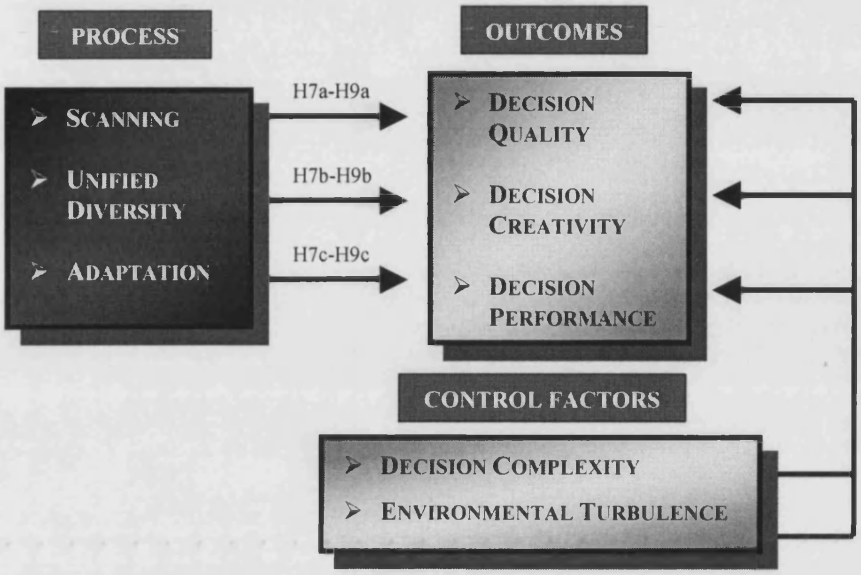
Independent Variable	Hypothesis Number			Postulated Linkage			Result		
	Scan	Un.Div	Adapt	Scan	UnDiv	Adap	Scan	Un.Div	Adapt
Centralization	H1a	H1b	H1c	-	-	-	ns (-)	ns (-)	ns (-)
Formalization	H2a	H2b	H2c	+	+	-	+	+	ns (+)
Innovative Culture	H3a	H3b	H3c	+	+	+	ns (+)	+	+
Interdepartmental Integration	H4a	H4b	H4c	+	+	+	+	+	+
Political Behavior	H5a	H5b	H5c	-	-	-	+	+	+
Organizational Memory	H6a	H6b	H6b	+	+	+	ns (+)	ns (-)	ns (-)

Scan: Scanning
Un. Div: Unified Diversity
Adapt: Adaptation
ns: not supported

7.3 Analysis of Variance of Decision Outcomes

The regression model pertaining to the three decision outcomes, i.e., decision quality, decision creativity, and decision performance with the corresponding hypotheses from Chapter 3 is presented in Figure 7.2 below.

FIGURE 7.2: DECISION OUTCOMES REGRESSION MODEL



The three resulting regression equations can be expressed as follows:

(1) $DecisionQuality = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + \varepsilon$;

(2) $DecisionCreativity = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + \varepsilon$;

(3) $DecisionPerformance = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + b_5x_5 + \varepsilon$,

where x_1= scanning, x_2= unified diversity, x_3= adaptation, x_4= decision complexity, x_5= environmental turbulence, and ε= error term.

7.3.1 Checking the Assumptions of Multiple Regression

- **Linearity**

As noted in the previous section, in order to assess the linearity of the relationship between each of the three dependent variables and the respective independent variables, residual plots were employed. Specifically, for each decision outcome regression

equation the predicted values of the depended variables were plotted against the studentized residuals values. The three plots, presented in Appendix III.5.B, demonstrate no evidence of non-linearity, as no specific patterns (e.g., curvilinear) emerge from the plots, thus ensuring that the three equations are linear.

➢ **Heteroscedasticity**

Analysis of the constancy of residuals across values of the independent variables was performed also through the three scatterplots of studentized residuals. No severe violations of the heteroscedasticity assumption are observed, given that the three plots show no pattern of increasing or decreasing residuals and the patterns appear to be close, in shape, to the null point, as described by Hair et al. (1998). Overall, the data exhibits no evidence to reject homogeneity of the error term variances.

➢ **Normality**

In order to check for normality of the each regression residuals two graphical methods were employed: (1) the histograms of the studentized residuals (Appendix III.5.B) and the normal probability plots (Appendix III.5.B). For the three decision outcomes regression equations, the assumption of normality does not appear to be violated, since (1) the histograms show near normal distributions of the studentized residuals and (2) the studentized residuals plotted on the normal probability plots follow reasonably closely the line of the normal distribution. Therefore, normality of the error term of the variate is fairly satisfied for all three equations.

➢ **Multicollinearity**

With reference to the independence of the predictor variables, the correlations of the three learning sub-processes and the variance inflation factors (VIF) in the equations were calculated. The correlation matrix (Appendix III.5.D) does not reveal any correlation coefficients larger than .30. Since the accepted criterion for multicollinearity is a coefficient greater than .90 (Hair et al. 1998), the first check in assessing independence of predictor variables appears to be satisfied.

The tolerance values and the corresponding VIFs were calculated for each predictor variable and are reported in Tables 7.4 to 7.6. All the tolerance values are large (i.e., relatively close to 1, the lowest being .79), with the corresponding VIFs relatively low

(the highest being 1.26), providing further evidence to suggest that multicollinearity is not present in the data.

7.3.2 Estimating the Regressions

Three standard linear multiple regression equations were estimated. Each dependent variable, i.e., decision quality, decision creativity, and decision performance was regressed on the three independent variables representing the learning process and the two control variables.

➢ **Decision Quality**

The regression results with decision quality as the dependent variable are reported below:

TABLE 7.5: MULTIPLE REGRESSION RESULTS FOR DECISION QUALITY

Multiple R	.496						
R^2	.246						
Adjusted R^2	.230						
Standard Error	.8589						
ANALYSIS OF VARIANCE							
	Sum of Squares	**DF**	**Mean Square**	**F**	**Sig.**		
Regression	55.294	5	11.199	15.181	.000		
Residual	171.880	233	.738				
Total	227.874	238					
VARIABLES IN THE EQUATION	**UNSTNDARDIZED COEFFICIENTS**		**STANDRD. COEFFINTS.**			**COLLINEARITY STATISTICS**	
	B	**SEB**	**Beta**	**t-value**	**Sig.-t**	**Tol.**	**VIF**
Constant	3.128	.560		5.585	.000		
Scanning	**.351**	**.051**	**.428**	**6.891**	**.000**	.839	1.192
Unified Diversity	**.317**	**.118**	**.164**	**2.691**	**.008**	.870	1.149
Adaptation	3.417	.055	.040	.618	.537	.792	1.263
Decision Complexity	**-.120**	**.060**	**-.118**	**-1.990**	**.048**	.918	1.089
Environmental Turbulence	-6.038	.061	-.061	-.994	.321	.861	1.161

Based on the above, the following can be inferred regarding the impact of the learning process and control variables on decision quality:

1. The F sig. is less than .05, suggesting that the model has explanatory value.
2. In examining the individual t-statistics, it is revealed that scanning and unified diversity have a significant impact on decision quality, while decision complexity is a significant controlling factor.
3. The positive signs and the magnitudes of the beta coefficients are meaningful and in line with the theory for all significant variables.
4. Scanning has the strongest impact on decision quality, followed by unified diversity.
5. The adjusted R^2 suggests that the three variables explain 23% of the variation in decision quality.

➢ **Decision Creativity**

The regression results with decision creativity as the dependent variable are reported below:

TABLE 7.6: MULTIPLE REGRESSION RESULTS FOR DECISION CREATIVITY

Multiple R	.574						
R^2	.329						
Adjusted R^2	.315						
Standard Error	1.0875						
ANALYSIS OF VARIANCE							
	Sum of Squares	**DF**	**Mean Square**	**F**	**Sig.**		
Regression	135.279	5	27.056	22.878	.000		
Residual	275.553	233	1.183				
Total	410.832	238					
VARIABLES IN THE EQUATION	**UNSTANDARDIZED COEFFICIENTS**		**STANDRD. COEFFINTS.**			**COLLINEARITY STATISTICS**	
	B	**SEB**	**Beta**	**t-value**	**Sig.-t**	**Tol.**	**VIF**
Constant	-1.069	.709		-1.508	.133		
Scanning	**.217**	**.065**	**.197**	**3.365**	**.001**	.839	1.192
Unified Diversity	**.353**	**.149**	**.136**	**2.366**	**.019**	.870	1.149
Adaptation	**.140**	**.070**	**.121**	**2.001**	**.047**	.792	1.263
Decision Complexity	**.514**	**.077**	**.376**	**6.714**	**.000**	.918	1.089
Environmental Turbulence	7.723	.077	.058	1.004	.316	.861	1.161

Based on the above, the following can be inferred regarding the impact of the learning process and control variables on decision creativity:

1. The F sig. is less than .05, suggesting that the model has explanatory value.
2. In examining the individual t-statistics, it is revealed that all three learning sub-processes have a significant impact on decision creativity and decision complexity is a significant controlling factor.
3. The positive signs and the magnitudes of the beta coefficients are meaningful and in line with the theory for all the variables.
4. The control variable of complexity has the strongest impact on decision creativity. Of the three predictor variables, scanning has strongest effect, followed by unified diversity, and adaptation.
5. The adjusted R^2 suggests that the four variables explain 31.5% of the variation in decision creativity.

➢ Decision Performance

The regression results with decision performance as the dependent variable are reported below:

TABLE 7.7: MULTIPLE REGRESSION RESULTS FOR DECISION PERFORMANCE

Multiple R	.469						
R^2	.220						
Adjusted R^2	.203						
Standard Error	.9752						
ANALYSIS OF VARIANCE							
	Sum of Squares	**DF**	**Mean Square**	**F**	**Sig.**		
Regression	62.449	5	12.490	13.132	.000		
Residual	221.599	233	.951				
Total	284.047	238					
VARIABLES IN THE EQUATION	**UNSTNDARDIZED COEFFICIENTS**		**STANDRD. COEFFINTS.**			**COLLINEARITY STATISTICS**	
	B	**SEB**	**Beta**	**t-value**	**Sig.-t**	**Tol.**	**VIF**
Constant	2.798	.636		4.400	.000		
Scanning	**.391**	**.058**	**.426**	**6.748**	**.000**	.839	1.192
Unified Diversity	**.270**	**.134**	**.125**	**2.012**	**.045**	.870	1.149
Adaptation	-1.907	.063	-.020	-.304	.761	.792	1.263
Decision Complexity	**-.156**	**.069**	**-.137**	**-2.269**	**.024**	.918	1.089
Environmental Turbulence	-2.101	.069	-.019	-.305	.761	.861	1.161

Based on the above, the following can be inferred regarding the impact of the learning process and control variables on decision performance:

1. The F sig. is less than .05, suggesting that the model has explanatory value.
2. In examining the individual t-statistics, it is revealed that scanning and unified diversity have a significant impact on decision performance, while decision complexity is a significant controlling factor.
3. The positive signs and the magnitudes of the beta coefficients are meaningful and in line with the theory for all the variables.
4. Scanning has the strongest impact on decision performance, followed by decision complexity, and unified diversity.
5. The adjusted R^2 suggests that these three variables explain 20.3% of the variation in decision performance.

7.3.3 Summary of Hypotheses and Results

The findings of the regression equations concerning the learning process outcomes are summarized in Table 7.8 below. Overall, out of the 15 hypotheses, 10 were supported by the findings.

TABLE 7.8: SUMMARY OF HYPOTHESES AND RESULTS OF THE LEARNING PROCESS OUTCOMES

Independent Variable	Hypothesis Number			Postulated Linkage			Result		
	DQual	DCreat	DPerf	DQual	DCreat	DPerf	DQual	DCreat	DPerf
Scanning	H7a	H7b	H7c	+	+	+	+	+	+
Unified Diversity	H8a	H8b	H8c	+	+	+	+	+	+
Adaptation	H9a	H9b	H9c	+	+	+	ns (+)	+	ns (-)
Decision Complexity	H10a	H10b	H10c	na	na	na	-	+	-
Environmental Turbulence	H11a	H11b	H11c	na	na	na	ns (-)	ns (+)	ns (-)

Dqual: Decision Quality; Dcreat: Decision Creativity; Dperf: Decision Performance

7.4 Synopsis

Having tested the model and presented the statistical results, the next chapter is concerned with an in-depth discussion of the above findings in relation to the theory.

CHAPTER 8

DISCUSSION

CHAPTER 8

DISCUSSION

"Generalization is necessary to the advancement of knowledge, but particularly is indispensable to the creations of the imagination"

-Thomas B. Macaulay
Milton (1825)

The objective of this study was to conceptualize and measure the organizational learning process: its sub-processes, its antecedents, and its marketing decision consequences. Central to this endeavor was to integrate, theoretically and empirically, the construct of interpretive diversity in the learning process.

In this chapter the findings relating to the empirical testing of the model are discussed. The chapter is organized in three main sections. First, the influences of organizational context antecedents on the three learning sub-processes are considered. Second, the effects of the learning process on decision effectiveness are discussed. Finally, the impact of the controlling variables on the decision outcomes is explored.

8.1 The Impact of Organizational Context on the Learning Process

A total of six hypotheses were developed regarding the impact of organizational context on the learning sub-processes of scanning, unified diversity, and adaptation. The results are summarized below:

H1: Contrary to the expectations that centralization of structure would be associated with the three learning sub-processes, the hypothesized relationships (H1a-H1c) were not supported.

H2: As was predicted, formalization of structure was associated positively with scanning (H2a) and unified diversity (H2b), providing partial support for H2. The hypothesized relationship with adaptation (H2c) was not supported.

H3: As was predicted, innovative culture was associated positively with unified diversity (H3b) and adaptation (H3c). The relationship with scanning (H3a) was not supported.

H4: As was predicted, interdepartmental integration was associated positively with all three learning sub-processes (H4a-H4c), providing complete support for H4.

H5: As was predicted, political behavior is associated with the three learning sub-processes. However, contrary to the expectations the nature of its effect is opposite of the anticipated one, for all the linkages (H5a-H5c).

H6: Contrary to the expectations, the hypothesized relationships between organizational memory and the three learning sub-processes (H6a-H6c) were not supported.

As is evident from the above, four organizational context variables influence the learning sub-processes identified in this study: formalization, innovative culture, interdepartmental integration, and political behavior. Of the four significant variables, only political behavior has an opposite effect on learning from the one anticipated. Contrary to the expectations, centralization and organizational memory do not appear to be significant determinants of the learning process. The findings are discussed in terms of each predictor variable below.

➢ **Centralization of Structure**

The results of the study do not provide support for the hypothesis that decentralization of structure enhances learning. None of the specified links between centralization and the learning sub-processes was significant, although the sign of all relationships were negative, as anticipated.

This finding is somewhat surprising, given that a number of studies that have established a link between centralization and information processing activities in the past (e.g. Jaworski and Kohli 1993; John and Martin 1984; Desphandé 1982). A possible explanation lies with the fact that in this study, centralization was measured at the organizational level, whereas, following Daft and Weick (1984), the learning sub-processes were investigated at the decision-making group level. For instance, Thomas and McDaniel (1990) note that it is the structure of the top management team that provides the context for the interpretation of strategic issues, rather than the structure of the entire organization. In this sense, it is possible that the different organizational levels employed here can account for the insignificant findings, and had centralization been measured at the group level, the result could have been significant.

➢ **Formalization of Structure**

The findings support the notion that formalization of structure facilitates learning by improving scanning and enhancing unified diversity. However, contrary to expectations, formalization had no impact on adaptation.

Specifically, it was found that formalization enhances *scanning* activities, by institutionalizing and guiding procedures for the gathering of market information. In this sense, the study offers additional support to the Jaworski and Kohli (1993) position that well-established rules and procedures are likely to facilitate rather than hinder the intelligence generation process.

In addition, formalization of structure was found to encourage the development of *unified diversity* during the interpretation process. This result corroborates the findings of Miller (1987) that formalization results in a well-developed, formal ability to analyze information, thereby increasing the range of perspectives considered (i.e., content diversity). At the same time, it appears that the presence of standardized routines associated with formalization also fosters the development of consensual frames that guide the evaluation of incoming market information (i.e., frame consensus).

Contrary to the initial hypothesis, formalization was not found to impact *adaptation*. Typically, an emphasis on rules and procedures is argued to cause an organization to be less adaptive to the external environment (Menon et al. 1999). In addition to this, the inverse relationship between formalization and utilization of market information has been demonstrated in a number of studies (e.g. Desphandé and Zaltman 1992; John and Martin 1984). Here, however, findings parallel the results reported by Jaworski and Kohli (1993), who found that formalization of structure was not associated with the responsiveness dimension of market orientation. According to these authors, a likely explanation is that a mere emphasis on rules and procedures is less relevant for responsiveness to market intelligence, than the precise nature of the rules and procedures. In other words, adaptation of strategic action in response to market information might not depend on the *extent* of formal rules and regulations, but rather on the *nature* of these procedures. It follows from this, that additional research to examine the linkage between the nature of formalized procedures and adaptation is required.

➢ **Innovative Culture**

Regarding the impact of innovative culture on the learning processes, the results indicate that a culture of innovation promotes unified diversity and adaptation in organizations, but does not influence scanning.

Although the finding concerning the relationship with *scanning* is somewhat surprising – after all, an innovative culture is expected to actively promote information generation (e.g. Menon and Varadarajan 1992) – it is at the same time consistent with Moorman (1995). In a similar study the author found that none of the cultures in the competing values model (e.g. Desphandé, Farley, and Webster 1993) were significantly related to information acquisition processes. In this sense, rather than concluding that an innovative culture does not encourage scanning processes, a possible explanation might be that because information acquisition processes are fairly common in most organizations, cultural antecedents are not predictive of their presence (Moorman 1995).

Consistent with expectations, a culture of innovation has a positive effect on *unified diversity*. Hence, the findings of this study offer empirical evidence to base theoretical assertions that culture influences the processes for collective sense making (e.g. Sackmann 1992). Specifically, the results suggest that an innovative culture will positively impact the level of unified diversity that decision-makers are able to generate by (1) creating an atmosphere that fosters the development of multiple perspectives (Menon et al. 1999) and (2) by guiding beliefs towards the consensual development of interpretive frames (e.g. Harris 1994).

Finally, the study confirms that innovative culture affects the level of *adaptation*. This result is consistent with Menon et al. (1999), who found that a culture of innovation impacts marketing strategy making in organizations, as well as with the Desphandé and Webster (1989) assertion that organizational culture is central to managing marketing activities. In summary, these findings extend prior research in organizational culture, by suggesting that sense making and adaptation require innovative ideologies that allow both openness to multiple perspectives and a willingness to take risks (e.g. Menon et al. 1999).

➢ **Interdepartmental Integration**

Although formalization of structure and innovative culture influence some of the learning sub-processes, interdepartmental integration affects positively all three learning

components and is the strongest explanatory variable in terms of scanning (standardized beta, b = .361) and unified diversity (b = .244). This finding provides empirical support for the Daft and Huber (1987) proposition that communication is central to organizational learning.

Specifically, the results suggest that effective communication and collaborative relationships between departments enhance the *scanning processes*, by regulating the structure and nature of information flows in the organization.

In addition to this, the findings indicate that interaction and collaboration facilitate the *interpretation process*, by "*providing a mental state of readiness as people prepare to interact with each other rather than a haphazard exchange*"(Barker and Camarata 1998: 450). This suggests that interdepartmental integration provides a context that encourages the emergence of multiple interpretations during the decision-making process (content diversity), and at the same time, ensures an atmosphere of effective relationships and frame alignment between members (frame consensus). This effect of interdepartmental integration on diversity is also in line with Menon et al. (1996) and Amason (1996), who found that team spirit and interconnectedness lead to positive conflict in the decision-making process.

Last, consistent with a number of studies focusing on information utilization (e.g. Maltz and Kohli 1996; Ottum and Moore 1996) and responsiveness to market intelligence (e.g. Jaworski and Kohli 1993), interaction and collaboration processes were found to increase *adaptation*, suggesting that a context of information exchange and cooperation encourages decision-makers to constantly re-assess their assumptions and develop choices in response to market information.

➢ **Political Behavior**

Contrary to expectations, political behavior was found to have a positive effect on each of the three organizational learning sub processes. This result is both counter-intuitive and contrary to the theoretical predictions; it presents however an interesting explanatory challenge.

One reason for political behavior's positive effect on the *scanning process* may be attributed to the fact that groups and individuals operating in a highly political context are likely to engage in intensive information search activities to reinforce their own arguments, positions, and self-interests. Goldstein, Marcus, and Rausch (1978) for

instance, describe how powerful individuals often welcome evaluation research, but simultaneously look for and select results to justify established policies and procedures. Choo (1998) also notes that, in political contexts information gathering intensifies because "*information to support a favorite alternative is accumulated by a broad scan covering several sources*"(p. 188). In this sense, it is possible that the main issue relating to scanning activities in politically charged contexts, is not one of intensive, wide-coverage scanning, but a parochial, interest driven search, which although broad, is highly selective in terms of filtering. Politicization of context shifts the emphasis from information scanning as a means to effective *organizational* decisions, to information scanning as a means of achieving and bolstering *personal* power.

The positive impact of political behavior on *unified diversity* may also be accounted for. First, conflict arising from coalition building, lobbying, and other political activities may decrease consensus on the content of interpretations (Dutton et al. 1983). Second, empirical evidence (e.g. Eisenhardt and Bourgeois 1988) supports the notion that powerful members of a top management team can control the frames for information interpretation, so that their personal preferred evaluative categories dominate, resulting to frame consensus. This notion of frame control is also highlighted by Choo (1998), who notes that in political contexts: "*information is checked and verified in some detail to increase its credibility and to ensure that it will withstand adversarial scrutiny*" (p: 188.) In summary, political behavior may facilitate unified diversity of interpretation because it increases the number of perspectives brought into the decision-making process, generating content diversity, and concomitantly reduces frame diversity through powerful members selectively filtering-out information that contradicts preferred frames and pressing for group commitment. The findings suggest that this phenomenon is worthy of further empirical and conceptual investigation.

The notion of the powerful members exerting tangible influence during the meaning creation process and pressing the others for commitment and modification of their own frameworks, could also help explain why political activity was found to enhance *adaptation.* As noted before, adaptation in this study is comprises of the level of (1) information utilization and (2) change in managerial cognition. Information utilization is often seen to include a symbolic dimension (e.g. Menon and Varadarajan 1992). Symbolic use means that information can be misused and distorted, resulting in a partisan use of intelligence for legitimizing and sustaining specific positions (Menon and

Varadarajan 1993; Beyer and Trice 1982). According to Choo (1998), in political modes of decision-making information use is highly controlled and directed as a political tactic to justify preferred outcomes. In this sense, political behavior can influence the utilization component of adaptation, through intensifying the symbolic use of information. If powerful members, who also press for the adaptation of interpretations to fit their own frameworks, use information symbolically, it would also explain why adaptation seems to increase with political activity.

The above discussion does by no means imply that organizations that foster political behavior are likely to modify their learning capabilities in a direction that enhances organizational effectiveness. On the contrary, it suggests that political behavior will influence learning and information processing activities in a manner that distorts them beyond their intended purpose. In this sense, this otherwise surprising finding also provides a useful illustration of how the reciprocal interaction between organizational context and the learning sub-processes can sometimes work in a way that is counterproductive. Although organizations do learn through the learning sub-processes, the *way* they will employ these processes and *what* they learn in the process can also be very important. As Nevis, DiBella, and Gould (1995) note: "*all learning is not the same; some learning is dysfunctional, and some insights or skills that might lead to useful new actions are often hard to attain*" (p. 74). Hence, if a highly political organization has learned to employ the sub-processes in a symbolic manner, learning will still occur, but it will also involve the reinforcement and acquisition of dysfunctional habits and practices, leading to organizational ineffectiveness in the longer term.

➢ **Organizational Memory**

The study does not find support for Huber's (1991) assertion that the basic information processes contributing to organizational learning depend on organizational memory. None of the hypothesized relationships pertaining to the effect of memory level on scanning, unified diversity, and adaptation were supported. One potential reason for this finding could be that the *level* of organizational memory might be less important than *how* an organization stores its knowledge (e.g. Moorman and Miner 1997; March 1991). The "how" relates to retention and retrieval of stored information and encompasses memory *dispersion* and *accessibility* (e.g. Moorman and Miner 1997). It may be argued, that the ability to easily locate and retrieve knowledge stored in memory, might also play

an important role in the facilitation of the learning processes at the group level. In other words, it might be more important to look at the degree to which existing knowledge and skills are shared between group members, rather than the overall level of existing information and experience residing in an organization's memory (Moorman and Miner 1997). In this respect, the results also imply that rather than focusing on the sheer amount of what an organization knows, concentrating on the processes of converting, recombining, and infusing existing knowledge into new forms during the learning processes could potentially be more consequential to our grasp of how organizational memory works (e.g. Nonaka 1991).

A second reason for the non-significant results could be that organizational memory interacts with the environment, or decision complexity, to influence the learning sub-processes. Specifically, it can be postulated that in contexts of high environmental turbulence and correspondingly high decision complexity, the past becomes a poor guide to the future. Moorman and Miner (1997) for instance, found that in the presence of high technological turbulence high levels of memory dispersion detract from creativity. Effective learning in this sense may be seen to become increasingly uncoupled from past memory. Thus, further research could fruitfully address the moderating impact of external variables on the relationship between organizational memory characteristics and the learning sub-processes.

Finally, some explanation for the insignificant relationships could be attributed to methodological issues. Like in Moorman and Miner's (1997) study of memory, key informants here were asked to provide assessment of the organizational memory level after the acquisition of new information and the completion of the decision. Although the questions were designed to focus the managers' attention on the appropriate time period for each variable, the potential for bias still exists. Overall, the findings of this study suggest that the relationship between organizational memory and learning is complex and should be further researched.

8.2 The Impact of the Learning Processes on Marketing Decision Outcomes

A total of three hypotheses were developed regarding the impact of the learning sub-processes of scanning, unified diversity, and adaptation on the decision effectiveness

variables of decision quality, decision creativity, and decision performance. The results of the learning sub-processes' impact on decision outcomes are summarized below:

H7: As was predicted, scanning was positively associated with the three decision effectiveness variables (H7a-H7c), providing total support for H7.

H8: As was predicted, unified diversity was associated with the three decision effectiveness variables (H8a-H8c), providing total support for H8.

H9: As was predicted, adaptation was associated positively with decision creativity (H9b). The relationships with decision quality (H9a) and decision performance (H9c) were not supported.

As is evident from the above, the learning process appears to have a significant effect on the effectiveness of strategic marketing decisions in organizations. Specifically, scanning and unified diversity are important determinants of all three decision outcomes, i.e., decision quality, decision creativity, and decision performance, while adaptation was found to be associated with decision creativity. The findings are discussed in terms of each predictor variable below.

➢ **Scanning**

Scanning was found to be positively related with all three decision outcomes and is the most important explanatory variable of decision quality (b = .428) and decision performance (b = .426).

These findings support the linkages that previous research has made between a firm's information acquisition processes and firm *performance* indicators (e.g. Jaworski and Kohli 1993; Sinkula et al. 1997). Moreover, the finding that scanning processes significantly impact *decision creativity* is potentially an important contribution. The literature has seldom addressed this link, and in the rare cases where it has, there has been limited success in confirming the nature and strength of the relationship (e.g. Moorman 1995). A further important contribution of this research is empirically addressing the value of scanning processes for marketing *decision quality*. The results here demonstrate that the amount and breadth of market information acquired for decision-making are important contributors to the quality of strategic marketing decisions in organizations.

➢ **Unified Diversity**

The study offers support for the hypothesis that unified diversity during interpretation of market information will produce more effective marketing decisions. Specifically, unified diversity was found to be positively associated with all decision effectiveness measures, i.e., decision quality (b= .164), decision creativity (b = .136), and decision performance (b = .125).

Consistent with Fiol (1994), this research establishes that *decision quality* is enhanced when multiple perspectives are brought to bear on market information, *as long as* there is consensus around the framing of the information. In this respect, the results also corroborate the findings of Amason (1996) and Dooley and Fryxell (1999) that decision quality improves as divergent opinions are sought and considered, in contexts that allow the preservation of harmony among group members.

Previous work on information processing and conceptual utilization of market information (e.g. Moorman 1995) suggests that there is a gap in our understanding of how conceptual use of information translates into creative strategies. This study addresses this question, by showing that *creative decisions* are the outcome of unified diversity. Organizations seeking to generate creative solutions, should consider the challenging issue of how to generate interpretive content diversity within unifying frames of information.

Last, this research offers empirical evidence that unified diversity will also enhance the *performance* of marketing decisions. Therefore, it confirms the notion that a learning process, wherein the parties come to discover and invent new alternatives through active debate and dialectical interaction, leads to enhanced performance (e.g. Amason 1996; Fiol 1994; Schweiger et al. 1986).

➢ **Adaptation**

In considering the impact of adaptation on decision effectiveness, the results indicate that adaptation is positively associated with decision creativity, but neither with decision quality nor with decision performance. A possible explanation for these findings is that although adaptation in response to market information, can lead to creative solutions, it is not necessarily a sufficient condition to ensure on its own that subsequent actions will be associated with high quality and performance outcomes. For example, the construct of adaptation does not take into account factors such as the feasibility of a decision in

terms of time and resource constraints. Because such factors are associated with the successful implementation of a decision, they are also important components of a decision's quality and market performance (e.g. Nutt 1998). This leads to the speculation that the relationship between adaptation and decision quality/performance maybe influenced by factors such as decision commitment (Dooley and Fryxell 1996), level of adoption (Nutt 1998), acceptance (Amason 1996), and quality of implementation (Dean and Sharfmann 1996). Further research is, therefore, needed for systematically studying the effects of the action component of learning on decision effectiveness.

8.3 The Impact of Control Variables

Although no formal hypotheses were offered in relation to the control variables, consistent with expectations, the level of complexity associated with a marketing decision was found to play an important role in the outcomes of the decision. On the other hand, environmental turbulence was not found to be significantly related to any of the decision effectiveness components. The results pertaining to the two control variables are discussed in turn below.

➢ Decision Complexity

Consistent with expectations, decision complexity has a significant influence on decision effectiveness, and it was found to negatively affect decision quality and performance and positively impact decision creativity.

Specifically, the study shows that the perceived level of difficulty and variability in a strategic marketing decision is associated with creative outcomes. Because decision complexity involves high levels of uncertainty concerning the processes for carrying out particular tasks and predictability of outcomes, in complex decision situations managers are likely to gather additional information and put it to more creative uses, compared to less complex decision circumstances (e.g. Menon and Varadarajan 1992).

On the other hand, because of the variability involved in complex decisions, an important amount of adjustment in the processes of making and carrying out the decision is required. Because adjustment can take a long time to be implemented and can also be resisted by organizational members, it may explain why complex decisions can be

perceived as lower *quality* decisions. In this sense, a high level of difficulty and complexity can undermine the overall planning and implementation process, by causing delays and implementation difficulties, thereby negatively affecting both decision quality and performance.

➢ **Environmental Turbulence**

Findings concerning the impact of environmental turbulence on decision effectiveness do not support the relationships for any of the outcome variables. In other words, *decision quality, creativity, and performance* do not appear to be affected by varying levels of market turbulence, competitive intensity, and technological turbulence. Although this result contradicts the study of Dean and Sharfman (1996), who found that environmental context significantly impacts decision effectiveness, it can be partly attributed to the fact that environmental turbulence is a macro variable, whose effect is more likely to be apparent on organizational level performance measures, rather than on specific marketing decision outcomes. Moreover, because environmental turbulence is effectively linked with decision complexity (see Chapter 3), its impact on decision effectiveness could be mediated through the level of decision complexity.

8.4 Synopsis

The results of the study show that the organizational context has a significant effect on the organizational learning process, which in turn impacts marketing decision outcomes. Specifically, it was shown that *scanning processes* are positively influenced by the extent of formalization of organizational activities, the degree of integration among the different departments, and the level of political activity. *Unified diversity* is positively impacted by the degree of formalization, the extent to which the culture in the organization is innovative, the degree of interdepartmental integration, and the level of political behavior. Last, *adaptation* was found to be positively related to innovative culture, interdepartmental integration, and political behavior. The constructs of centralization and organizational memory were not found to be significantly related to the learning process.

Furthermore, the study shows that the learning sub-processes and the level of perceived complexity associated with decisions have important implications for the

effectiveness of strategic marketing decisions. Specifically, *decision quality* was found to be positively influenced by the level of scanning and unified diversity, and negatively related with decision complexity. Moreover, *creativity* of marketing decisions was found to be positively affected by all learning sub-processes and the level of decision complexity. Finally, the *performance* of a decision appears to be positively related to scanning and unified diversity, and negatively to decision complexity. Environmental turbulence does not appear to significantly impact decision effectiveness.

Having discussed the results of the empirical testing of the model, the next chapter turns to the discussion of the study's implications for research and practice, and to the identification of the main limitations associated with the thesis. Finally, a number of areas for further research are proposed.

CHAPTER 9

REFLECTIONS:

IMPLICATIONS, LIMITATIONS, AMPLIFICATIONS

CHAPTER 9

REFLECTIONS: IMPLICATIONS, LIMITATIONS, AND AMPLIFICATIONS

"Sense may be in the eye of the beholder, but beholders vote and the majority rules"

Karl Weick
Sensemaking in Organizations (1995)

Simple questions are often the most profound. Such was the nature of the recent query: "*Is interpretive diversity a good thing?*[1]", which initially prompted the following retort: "Yes, for this research has demonstrated diversity's positive impact on decision effectiveness". Yet observation is not explanation: "what" has to be complemented by "why", or in the words of Berthon (2000): "*Sight without insight is blind*". And so, a more insightful interpretation is found in the following answer: "Interpretive diversity is a good thing because it is based on principles of democracy, rather than demography" – demographic diversity being the mode of diversity most often studied in management.

Interpretive diversity, as with the concept of organizational learning, is based on the belief that people in organizations are collectively capable (Dixon 1999). As people interact to take organized action they create minorities and majorities, and in doing so, develop the infrastructure that creates sense: "*This infrastructure varies in the frequency with which it generates good arguments, advocacy, and divergent thinking, as well as "the spirit of contradiction"*" (Weick 1995: 144). When an event triggers the need for information processing "*differences, minorities, and majorities become evident in meetings, and people argue their way into a new sense of what they confront*" (Weick 1995: 145). As such, this study's interpretive diversity findings are testament to the fact that multiple contributions in the meaning creation process play an important role in making organizational learning more workable and subsequent action more effective.

In this respect, the model of antecedents and consequences developed and tested in this thesis offers a number of theoretical, practical, and methodological topics to reflect upon. This chapter is set out as follows. First, the theoretical implications of the research are discussed and the academic contribution of the research is specified. Second, the practical implications are deliberated and the potential contribution to managerial

[1] My thanks to the University of Bath Marketing Department interview panel for this question.

practice is explored. Third, the limitations of the research are presented, and finally an agenda for future research is proposed.

9.1 Theoretical Implications

The objective of this study was to conceptualize, operationalize, and measure the organizational learning process, its antecedents, and marketing decision consequences. It is the first research attempt to integrate the construct of interpretive diversity in an empirical model. In achieving this objective, a number of theoretical and research contributions are apparent.

➢ Integrating Learning & Interpretation

First, the thesis provides a conceptualization and operationalization of organizational learning that is more comprehensive compared to the frameworks currently found in the marketing literature, in that they fail to incorporate the process of information interpretation (e.g. Moorman, 1995; Sinkula et al. 1997). Here, a theoretical framework for addressing the concept of interpretation is proposed and the construct of interpretive diversity is developed and empirically tested. In this respect, the study contributes in the area of interpretation and organizational learning by "*moving from speculation to empirical research*" (Huber 1991: 103), and by offering a functional way for studying the collective processes of meaning creation. Moreover, the study advances Fiol's (1994) exploratory work on consensus building along different dimensions of meaning, by allowing for the interactions of the content and framing of interpretations using information variables. In this sense, the operationalization of interpretive diversity proposed here provides a more direct assessment of the cognitive interpretation processes, as opposed to the negotiating processes, that lead to the development of collective meaning. Most importantly, the study offers empirical evidence to support Fiol's (1994) theory by testing and confirming the proposition that unified diversity is associated with positive organizational outcomes. In this respect, the thesis adds to the emerging body of research in management and marketing linking organizational learning processes to performance.

➢ Linking Learning & Decision-Making

Second, the thesis links two important fields of research: organizational learning and strategic decision-making. Specifically, it extents prior work (e.g. Sinkula et al. 1997) on

organizational learning in the context of marketing strategy by exploring the effects that learning processes have on marketing decision outcomes, using systematic quantitative data. Two important contributions follow from this:

(1) The study operationalizes action, the outcome measure of learning, by employing the construct of adaptation, that links changes in cognition directly to market information responsiveness in the stages of decision-making. In previous marketing studies, the action component of learning was linked either with utilization of information (Moorman 1995) or marketing program dynamism (Sinkula et al. 1997). However, according to Rajagopalan and Spreitzer (1997), in order to define the domain of managerial actions in learning and change, researchers should also draw upon the broader literature on strategic decision processes, including theory on the role of cognitive change in the shaping of new strategy as well as on the decision-making stages of generating, evaluating, and choosing among alternatives. Based on this, the scale of adaptation developed here is the first attempt to provide a measure of action that captures the extent to which change in managerial cognition, resulting from information use, affects each of stages in the strategic decision-making process.

(2) In this study a comprehensive set of marketing decision effectiveness measures was for the first time realized. The outcomes of learning-related processes have traditionally focused on aspects such as overall business performance (e.g. Jaworski and Kohli 1993; Thomas et al. 1994), or new product outcomes (e.g. Moorman 1995; Moorman and Miner 1997). The direct relationship between information processes and decision outcomes, such as decision quality or creativity, was never explored, but was usually inferred from the overall level of performance. Moreover, although scholars in the management literature have explored the concept of decision quality (e.g. Amason 1996; Nutt 1998; Dooley and Fryxell 1999), "*the causes and consequences of quality of strategy have received scant academic research attention in marketing*" (Menon et al. 1996: 304). Here, following Nutt's (1998) recommendations that studying decision consequences requires multiple measures of decision outcomes, three marketing decision effectiveness scales were developed and tested: decision quality, decision creativity, and decision performance. In this respect, another contribution of the study was to categorize important marketing decision outcomes and to establish valid and reliable measures for them. Following from this, the study demonstrates that decision

effectiveness is significantly improved by managing the processes of scanning, interpretation, and adaptation.

➢ **Contextualizing Learning**

Finally, the study expands our understanding of organizational learning by examining the organizational context antecedents of the learning sub-processes for effective strategic marketing decisions.

(1) The study adds to the literature on the effects of organizational structure on information processes, by showing that formalization has positive effects on aspects of learning. In the past the impact of formalization was unclear, given that some researchers advocated negative effects (e.g. Desphande 1982; Thomas and McDaniel 1990), while others positive outcomes (e.g. Jaworski and Kohli 1993). Here it was shown that a formalized structure plays an important role in institutionalizing practices associated with scanning and the development of unified diversity.

(2) The results add to the literature on the role of culture in organizational learning (e.g. Sinkula et al. 1997). Specifically, the study addresses Menon et al.'s (1999) call for additional research on the consequences of an innovative culture, by showing that the adoption of a culture of innovation enhances an organization's propensity to generate unified diversity and to adapt its decision-making to market information.

(3) An important contribution of the study is that it provides empirical evidence for the positive relationship between interdepartmental integration and organizational learning. Although much has been written about the importance of cross-functional integration on information processes and performance (e.g. Kahn 1996; Ottum and Moore 1997), and the role of communication in organizational learning (Barker and Camarata 1998; Duncan and Weiss 1979), previous research has never provided empirical evidence on the impact that the joint development of interaction and collaboration processes has on the development of organizational learning. Here it was shown that interdepartmental integration is a key organizational context variable for the enhancement of the learning process.

(4) Although the empirical evidence in this study do not support the relationship between organizational memory level and the learning sub-processes, the development of valid reliable measurement scales for assessing procedural and declarative memory are an important step in furthering our understanding of this complex construct. The

findings here indicate that future studies on organizational memory, in addition to level, should also consider characteristics such as accessibility and dispersion.

9.2 Managerial Implications

Day and Montgomery (1999), in charting new directions for marketing in the latest special edition of the *Journal of Marketing*, note that the past decade brought about a data explosion, which places major burdens on marketing managers, and argue that: "*Managers understandably need help digesting and using this data tsunami*" (p. 10). Understanding the learning process in organizations and how managers can provide meaningful interpretations of the market information they collect is critical for marketing practitioners. As Daft and Weick (1984) suggest, an interpretation approach "*...says that the job of management is to interpret, not to do the operational work of the organization. The model* [of interpretation] *calls attention to the need in organizations to make sense of things, to be aware of external events, and to translate cues into meaning for organizational participants*" (p.294). In answer to these calls, the motivation behind this study was to create a model that can help organizations become more skilled in the process of interpreting market information. More importantly, the model gives managers an a priori basis for focusing on the critical components of the learning process and its organizational level determinants and enables the post hoc analysis of prior strategic marketing decisions (eg. Menon et al. 1999).

➢ Interpretation and Enhancing Decision Effectiveness

The key implication of the thesis is that the type and level of interpretive diversity that top managers generate in interpreting information for decision-making, is a strong predictor of marketing decision effectiveness. As such, it appears that managers should work towards the development of unified diversity to enhance learning and attain higher decision quality, creativity, and performance. In addition to unified diversity, managers should also focus on the scanning and adaptation activities associated with the learning process. Thus, the model calls for attention on all three activities that make up the process of organizational learning, that is, on the need to be constantly aware of market developments, to convert information into creative interpretations, and to act in response to market information. The findings show that the successful application of these

processes will improve the effectiveness of marketing decisions and suggest that managers should call for their continuous assessment.

➢ **Creating an Effective Organizational Context**

Following the evaluation of the nature and level of an organization's learning capabilities, a second step for management is to create an environment that facilitates learning and creative interpretations. The study suggests that managers can enhance the learning processes and interpretive capabilities of their organizations, by managing a number of key organizational variables.

Specifically, both scanning and unified diversity are facilitated by the adoption of formalized procedures and routines for carrying out marketing tasks. Of critical importance to management is the issue of which activities should be formalized and which should be informal. The findings here suggest that managers should formalize activities associated with scanning processes, and establish procedures that allow the open participation of individuals from multiple groups in the sense making process. Consequently, it is for management to embrace formalized structures that institutionalize information acquisition processes and enable the smooth coordination and alignment of team members, by ensuring the appropriate functional and divisional representation on decision-making teams.

In addition to this, a clear implication of this research is the importance of developing a culture of innovation that allows the development of unified diversity and adaptation. The evidence indicates strong support for creating an organizational climate that will promote the generation and exchange of knowledge, ideas, and perspectives and will encourage people to take informed risks and act upon innovative interpretations (e.g. Menon et al. 1999; Sinkula et al. 1997). However, the task of developing such a culture is very demanding. As Sinkula et al. (1997) note, although modifications of organizational structure are relatively easy and quick to implement, because they are well within top management's control, establishing cultural changes is much more difficult and takes considerable time and effort to realize. Because of this, managers should first and foremost focus on creating an environment that fosters the *unlearning* of routines and behaviors which discourage innovation and openness (e.g. Nystrom and Starbuck 1984). Thus, an important initial task is to "*cultivate the art of open, attentive listening. Managers must be open to criticism*" (Garvin 1993: 87). Moreover, creating a

conductive climate for the development of learning requires commitment from the top (Senge 1990; Slater and Narver 1995). Slater and Narver (1995) note that it is the leaders in the organization who can instill a culture that cultivates learning, by motivating and communicating a well-crafted vision of a learning organization.

While the role of top managers in engendering an innovative culture for learning is important, it appears that the nature of interdepartmental integration plays an even more fundamental role in enhancing the organizational learning sub-processes. Both dimensions of integration, i.e., interaction and collaboration, are key to learning, because they regulate communication among organizational members. As Duncan and Weiss (1979) note, "*organizational learning, will be possible only to the extent that there is communication*" (p.94).

Interaction facilitates information exchange among the different departments by regulating the nature and frequency of communications in the organization. This implies that managers should configure internal systems and processes to move information across departmental boundaries through appropriate media and databases, as well as through the institutionalization of frequent meetings. According to Dixon (1992), an essential element in the development of an infrastructure that will facilitate the learning process is the need for both technology-based and face-to-face communication processes.

In addition to this, findings suggest that collaboration enhances the learning process by encouraging a higher level of interpersonal, egalitarian relationships that in turn cultivate a receptive setting for people from different functions to openly express, share, and challenge each other's perspectives. In this sense, the study reinforces the need for internal marketing efforts towards team working and constant dialogue among the different functions. For instance, dialogue-based informal meetings (in contrast to formal, presentation-based monologues), designed to give equal weight to all voices and enhance cooperation, can be particularly useful approaches to support learning, because they encourage information exchange, involve multiple perspectives, and can lead to adaptive actions (e.g. Dixon 1999). Moreover, techniques such as interdepartmental training programs, cross-functional activities, and alignment of interdepartmental objectives can be also instrumental in facilitating collaboration and thereby the development of shared mental models and coordinated action (e.g. Jaworski and Kohli 1993).

Duncann and Weiss (1979) note that organizational learning is also a social process. As such, it reflects not only the nature of communication within the organization, but also the political nature of the organization. It is widely accepted that organizations are characterized by political processes, in which individual power plays an important role in the knowledge acceptance and decision-making (e.g. Duncann and Weiss 1979). In this respect, strategic decisions are often seen as the outcomes of negotiation processes that occur among different groups in the organization, each seeking to further its own interests or goals (Franwick et al. 1994; Cyert and March 1992). Although the findings in this study concerning the nature of the effect that political activity has on learning were quite unexpected, an important implication to be drawn is that a political context may have important consequences as to *what* organizations learn, as well as on *how* they learn it. Because political behavior appears to have a strong impact on the processes by which organizations gather, process, and act upon information, the way in which these processes will be employed in a political context can have a detrimental effect on what an organization chooses to learn and how it changes its actions based on this knowledge. This means that managers in politically charged contexts should find ways that will enable them to constantly question, validate, and improve these processes. Duncan and Weiss (1979) for instance, point to the role that an integrator can play to help coordinate and moderate the diverse orientations and interests that different groups have, so that the organization's common objectives can be met. An integrator is typically a person who has wide contacts and relevant information in the organization and is seen as an objective party that can be trusted by the different groups. Indeed, academics or consultants can in some circumstances play such a role. The role of such a person is to facilitate information flow and to get the parties to produce alternatives and solutions by reaching agreement rather than through the exercise of power. In this sense, a focus on the development of lateral relations can also help the development of effective information processes that concentrate on the creative, rather than symbolic, use of information and knowledge.

Although organizational memory did not appear to have a significant effect on the learning process, it might be that the *accessibility* of procedural and declarative memory, rather than the *level*, is the key determinant of the learning processes at the group level. If this were so, it would imply that mechanisms for accessing memory are needed to ensure that knowledge is captured, conserved, and most importantly, can be retrieved

when needed (Day 1994). Mechanisms for capturing and accessing knowledge involve institutionalized systems for both "hard" data, such as integrated databases, computerized systems for transactions, and electronic blackboard systems, and "soft" information, through roles, stories, and informal routines.

➢ **Design Learning**

As a final step, managers should examine and attempt to improve each of the organizational learning sub-processes. Management of the most overt scanning processes is relatively simple to operationalize. Managers should focus on establishing processes for the widespread generation of information both from internal and from external sources. Acquiring information from external sources requires the systematic crossing of an organization's boundaries to interact with the external environment about customers, competitors, suppliers, industry, and technological conditions. By contrast, internal acquisition of information is developed through the process of conducting the organization's business, by analyzing successes and mistakes and by keeping open the routes through which information is internally diffused.

Yet, merely scanning and accumulating information is not enough for learning. As Weick (1995) notes, there is a tendency to treat many problems as lack of data, hoping to find solutions in additional information. However, "*most organizational problems do not require more information for resolution, rather it is the problem that needs to be reframed – to ask different questions instead of gathering more information about the same questions*" (Dixon 1999: 53). Interpretive diversity is the generation of different questions, through multiple perspectives in the interpretation of information. At the same time, it also suggests that the continuous collection of information through multiple sources can provide meaningful answers only when it is made available to others. As Friedlander (1983) notes: "*Organizational learning occurs at the interfaces between persons, between organizational units, and between the organization and its external environment*" (p. 199). Hence, "*as each system interacts with the external environment and then internally with other subsystems it creates a unique perspective which it then adds to the diversity of ideas*" (Dixon 1999: 95). In this sense, diversity is important because it fosters collective learning and provides a way for making sure that managers from many functions interpret market information, rather than only by the one

department. This in turn can help marketers to develop mental models that are more representative of organizational and marketplace realities.

The first step in the management of interpretive diversity is to recognize how it differs from traditional notions of diversity prescribed in the management literature. For one thing, managing interpretive diversity is considerably different from demographic diversity, i.e., differences based on gender, education, origin, etc. Although diversity on a demographic basis can introduce different perspectives in the process of strategy making, managing interpretive diversity requires more than structuring an organization to attract and hold a group of people from mixed backgrounds (e.g. Leonard 1998). This is because assembling groups of managers with different demographic origins does not necessarily ensure that different meanings and ideas will emerge. At the same time, demographic diversity is not essential to the presence of interpretive diversity because "*people of similar ethnic backgrounds or of the same gender can draw upon extremely different sources and types of creativity*" (Leonard 1998: 64). Second, interpretive diversity is not equivalent to the celebration of conflict in organizations, which has been an influential topic in the literature concerning problem solving and creativity (e.g. Menon et al. 1996; Amason 1996; Schweiger et al. 1986). The confrontation involved in the active seeking of conflict does not necessarily arise from different perspectives on the world, neither from constructing multiple meanings and cognitive pictures. Although interpretive diversity is one form of constructive confrontation, its purpose is to specifically support creative action by encouraging the development and integration of meanings in the learning process, or in the words of Leonard (1998): "*to create something that no single perspective could have*" (p.64).

A second step in the management of interpretive diversity concerns the mechanisms for the organization of group activity. Diversity of cognitive styles and capabilities, although not usually explicitly managed, can be employed in group design and integration activities to positive effect (Berthon 1993). Leonard (1998) for instance, suggests that a way to manage diversity in cognition is by acknowledging and encouraging differences in cognitive styles. In addition to this, hiring and selection criteria should also include the ability to collaborate across specialties as well as the interest and ability to learn collectively – qualities that are seldom revealed on resumes. Moreover, the role of a multifunctional or "multilingual" manager, i.e., capable of operating in more than one specialized area, in creating unified diversity can also be

crucial. Multilingual managers handle group processes by intervening in the interactions among group members, with a view to channel interpretations in a unifying direction without smoothing over differences in perspectives. "*The multilingual managers handle their interventions differently but always self-consciously, encouraging participants to focus on both the process and the content of the discussion*" (Leonard 1998: 78).

In summary, information use for the construction of meaning requires first, group and organizational processes that facilitate the sustained exchange and evaluation of information, and second, mechanisms that provide for a high degree of flexibility for the development of multiple perspectives among individuals (e.g. Choo 1998).

Finally, it is important for managers to understand that the tension between consensus and diversity in organizations is dynamic – "*organizations do not operate in isolation, but must constantly amend their assumptions and interpretations in response to what other organizations are doing and how the environment is changing*" (Choo 1998: 249). In this sense, further learning can only take place when group members frequently change their mental models and take innovative actions (Day 1994). This means that managers should also consider how their information-processing behaviors and willingness to re-evaluate their assumptions affect the organization's propensity to act. According to Sinkula et al. (1997) "*Learning-efficient organizations are likely to be more nimble, changing their marketing strategies in a rapid and fluid manner to anticipate, neutralize, or possibly flourish from shocks incurred in unstable environments*" (p.315). This means that adaptive learning requires that managers have the capacity to constantly challenge old assumptions, compose fresh meanings, and take concerted action based on the new meanings.

9.3 Limitations

There are several limitations associated with this study that should be taken under consideration. First, because of its cross-sectional nature, causality cannot be conclusively established, only inferred. A longitudinal study would help establish causality. Such a design would provide enough time for the effects of the described, decisions to be observed, and to increase confidence in the causal interpretation of the findings (Dean and Sharfman 1996).

Moreover, the informants assessed decision effectiveness after the implementation and completion of the decisions, which raises the potential of a retrospective justification bias (Moorman and Miner 1997). This type of bias occurs when respondents, knowing the outcome of the decisions, tend to give responses for the antecedent variables consistent with their knowledge of the final outcome. However, Menon et al. (1999) note that recent research suggests that the dangers of retrospective reports are generally overstated. Moreover, following Moorman and Miner (1997) particular attention was paid in the design of the questions with a view to focus respondents' attention on the appropriate time periods and thereby, help avoid this problem. Despite this, further research should attempt to obtain data on the independent variables from multiple sources or before decision outcomes are known.

A third related limitation is that the approach adopted in this study resulted in little control over the choice of decision in terms of its success. In other words, it was left up to the managers to choose a decision, suggesting that their reports might have been biased towards successful rather than unsuccessful decisions. Although managers were explicitly requested to describe the most recent strategic marketing decision that they participated in, rather than any decision of their choice, there is still the danger of a potential bias element. Further research could overcome such problems by explicitly asking respondents to describe their most recent successful or unsuccessful decisions.

Fourth, data were collected by using the single key informant approach (e.g. Menon et al. 1999). Although the use of multiple respondent designs remains the exception in most marketing studies (Moorman and Miner 1997), such an approach would probably provide a more robust assessment of interpretive diversity. Yet Miller et al. (1998) found that the use of a single informant was a reasonable proxy for the actual cognitive diversity among group members. Similarly, Moorman (1995) used single respondents to measure information processing, even though the study variables focused on perceptions of organizational level processes. Furthermore, the key informants were, in the vast majority of cases, executives from the marketing department, suggesting a more in-depth level of knowledge and involvement in the development and implementation process of the marketing decisions. Recent research, looking at the need to employ multiple informants instead of one senior manager as key respondent, found that single knowledgeable informants are adequate for reliable and valid data (c.f. Menon et al.

1996). Still, future studies are likely to enhance validity from seeking to assess interpretive diversity via a multiple respondent approach.

Another limitation, inherent in the study's chosen design, is that certain equivocal findings could not be clarified through qualitative debriefing interviews. Specifically, the unpredicted effect of political behavior on learning and the non-significant effects of centralization, organizational memory, and environmental turbulence, suggest that it would be useful to conduct post-survey interviews, which could provide an in-depth explanation of the relationships. Yet, the need for additional information to refine understanding of the results, came at the later stages of the process of the thesis, and was clearly beyond its scope. Future research, however, would be particular useful to clarify some of the findings in this study.

A final limitation of the study is that subjective, perceptual measures were used for many of the variables, decision outcomes in particular. Still, informants were asked both for their impressions on decision outcomes, i.e., levels of quality and creativity, as well as for more factual information, i.e., decision performance compared to sales or profits. In this sense, the inclusion of different types of measures for decision effectiveness helped to somewhat alleviate this problem. Nonetheless, in order to overcome such problems, future research could collect data on the dependent and independent variables using multiple methods and sources.

9.4 A Research Agenda

This study represents an initial attempt to measure interpretive diversity in the learning process and to explore the organizational level antecedents and decision related consequences of the three learning sub-processes proposed by Daft and Weick (1984). As a result, a number of opportunities for further research within the areas of interpretation and learning in marketing were uncovered.

A critical issue that warrants additional examination concerns the measures of interpretive diversity developed and tested in this study. The task of operationalizing the construct of "meaning" is challenging. Future research should further test the measures to determine whether the proposed dimensions are meaningful and exhaustive. For this purpose, different research methodologies for the collection of data could be fruitfully employed. For instance, Thomas et al. (1993) used a decision scenario approach to

capture the interpretive processes of top managers. Such an approach could provide a more direct way to assess the "content" dimension of meaning.

A direct issue for empirical assessment concerns the testing of the model of interpretive diversity presented in Chapter 2. The model of antecedents and consequences tested in this study concerns propositions relating only to the "creative interpretations" quadrant, that is, the *unified diversity* position. It would be of interest to see how the other quadrants relate to performance outcomes, and to explore whether unified diversity is indeed superior compared to the other forms of diversity that result from the interaction between the content and frame dimensions. Related to this, is also the issue of testing the propositions pertaining to the direct and indirect relationships among the three learning sub-processes. In other words, to test the linkages between scanning and the four modes of interpretive diversity, and how these are in turn related to adaptive action.

Furthermore, future research could examine the impact of additional variables on interpretive diversity and the learning process in general, in order to explain the processes more completely. The finding that interdepartmental integration was the only organizational antecedent variable to impact all learning processes, leads to the speculation that group coordination variables are also likely to be of major importance in enhancing the learning process. Related research questions could be: What group level variables affect scanning, interpretive diversity, and adaptation in organizations? How does the composition of the decision-making team affect the generation of interpretive diversity and learning in organizations? Focus groups, personal interviews, and other similar exploratory techniques can offer important additional insight for generating a more complete set of variables that influence these processes (e.g. Menon and Varadarajan 1992). In addition to this, the role of information technology and different media in the learning process is also an interesting area for research. Huber (1991) for instance, notes that different types of media, as well as media richness, are important determinants of the extent to which information is given common meaning by the sender and receiver of a message, because media convey too great a range of symbols for interpretation. This research area has also potential implications for the construct of information dissemination, which was not directly investigated in this study. The routing of information inside an organization is thought to be an important determinant of the occurrence and breadth of organizational learning (Huber 1991). Although in this study

information diffusion was partly covered by the construct of interdepartmental interaction, future studies could look at the direct effects of information distribution through different media and processes, on organizational learning and interpretation.

Finally, further research could investigate, in greater depth, some of the non-significant findings of this work. First, future studies should examine the role of organizational memory as a determinant of the learning process. It would be worthwhile to consider interaction effects in the organizational context, which might moderate the impact of memory on the learning sub-process (e.g. Moorman and Miner 1997). In addition to this, decision complexity or environmental turbulence could also moderate the relationship of memory to the learning sub-process. For instance, it might be that the decision complexity or environmental turbulence can dictate how much memory an organization needs to have, in order to enhance its scanning, interpretation, and adaptation processes (e.g. Moorman and Miner 1997). Second, the study's results indicate that further research is required to understand the relationship between adaptation and decision effectiveness. The concept of implementation could be a potentially important starting point. Dean and Sharfman (1996) suggest that the quality of implementation of a decision has a potent effect in decision effectiveness. In this respect, the construct of decision implementation is worth considering as mediating variable, regulating the relationship between adaptation and decision performance. Finally, although environmental turbulence did not appear to be a significant control variable, its role as a mediating variable between the learning process and decision effectiveness is worthy of further exploration.

9.5 Synopsis

In this chapter the implications, limitations, and directions for further research were discussed. It can be concluded that the model developed and tested in this thesis has interesting practical as well as theoretical implications. Moreover, the limitations and the null findings of the study offer interesting avenues for future research.

EPILOGUE

EPILOGUE

"I hate quotations. Tell me what you know."

- Ralph Waldo Emerson
Journal entry (1849)

The renewed emphasis in recent years on organizational learning has grown up in response to the emerging "information economy", "knowledge revolution", or "information technology age" characterizing this generation (Glazer 1991). With marketing gaining increasing prominence as a set of processes, rather than a function (Moorman and Rust 1999), a critical issue that arises for marketers is the management of the information processes that regulate the link between an organization and its market. However, despite the growing concern of the business and academic community over the management of knowledge processes, organizations still "*seem to lack the intelligence to appropriately interpret and act on the flood of information*" (Bettis and Prahalad 1995: 6).

The present study addresses this eminent problem by posing and answering the following research question: "What are (1) the components, (2) contextual antecedents, and (3) consequences of an interpretation-driven approach to the organizational learning process?"

The research question was addressed in the following way. First, by building on the Daft and Weick's (1984) model of organizations as interpretation systems, three main components of the learning process were conceptulized as: scanning, interpretive diversity, and adaptation. Here, the study introduced and addressed the critical issue of *interpretation efficiency*. That is, how to turn an organization into a skilled interpreter of environmental events. It was proposed that an effective response to environmental challenges depends on the nature and level of interpretive diversity that an organization is able to generate.

Building on the above conceptualization and proposition, a theoretical framework of interpretive diversity, based on the dimensions of content and framing of information, was developed, and the resulting interpretive diversity modes were linked with the two learning sub-processes of scanning and adaptation. It was proposed that creative interpretations would be the outcome of unified diversity –the interpretation mode

wherein a group develops diverse interpretations of information content, while converging around the frames used to order and evaluate the information.

Second, the study examined the effects that organizational context have on the learning sub-processes of scanning, unified diversity, and adaptation. In particular, the results show that managers can enhance learning and interpretations in their organizations by adopting a formalized structure, champion a culture of innovation, and promote interdepartmental interaction and collaboration.

Third, the study demonstrated that the successful application of organizational learning processes improves the effectiveness of marketing decisions. Specifically, the study showed that the level of scanning, unified diversity, and adaptation as well the extent of perceived decision complexity are important determinants of the quality, creativity, and performance of strategic marketing decisions.

The model of antecedents and consequences of the organizational learning process presented makes a number of valuable theoretical contributions. First of all, the study extends the literature of organizational learning by conceptualizing and operationalizing a comprehensive framework for studying the process of interpretation and its role in the learning process. Specifically, it represents the first research attempt to integrate the construct of interpretive diversity in an empirical model. Moreover, this research adds to prior work on learning in the context of marketing strategy, by exploring the effects that learning processes have on marketing decision outcomes, using systematic quantitative data. Finally, the study expands our current understanding of organizational learning, by examining the organizational context antecedents of the learning sub-processes for effective strategic marketing decisions.

Following from this, the results imply that managers must address not only the scanning and knowledge utilization capabilities of their organizations, but also their capacity to generate multiple interpretations, in order to enhance learning and attain higher decision effectiveness. This requires the continuous monitoring and improving of the learning sub-process and the adoption of an organizational environment that is favorable to their development and implementation.

The findings of the study must be seen as tentative, given the scant prior empirical research in the area of learning and interpretation, and the limitations inherent in the design and process of the research. Future research that would replicate the measures developed in this study, explain some of the unexpected or non-significant relationships,

and expand on the nature of influences on the learning sub-processes, would be a welcome addition to our understanding of the concepts of organizational interpretation and learning.

In conclusion, the components, context, and consequences of the learning process are complex and disorderly constructs and as such, often difficult to capture with existing models and assumptions about organizations. Nonetheless, the concept of interpretive diversity introduced in this thesis comprises an interesting and potentially useful perspective, upon which to extend and deepen our understanding of the complex cognitive activity that occurs in organizational learning.

BIBLIOGRAPHY

BIBLIOGRAPHY

Aaker, D. and Day, G. (1983), *Marketing Research.* New York, NY: John Wiley and Sons.

Allee, V. (1997), *The Knowledge Evolution: Expanding Organizational Intelligence.* Boston, MA: Butterworth-Heineman.

AMA Task Force (1988), "Developing, Disseminating, and Utilizing Marketing Knowledge," *Journal of Marketing*, 52 (October), 1-25.

Amason, A.C. (1996), "Distinguishing the Effects of Functional and Dysfunctional Conflict on Strategic Decision Making: Resolving a Paradox for Top Management Teams," *Academy of Management Journal*, 39 (1), 123-148.

Anderson, J.R. (1983), *The Architecture of Cognition.* Cambridge, MA: Harvard University Press.

Anderson, J.C. and Narus, J.A. (1990), "A Model of the Distributor Firm and Manufacturer Firm Working Partnerships," *Journal of Marketing*, 54 (January), 42-58.

Andrews, J. and Smith, D.C. (1996), "In Search of the Marketing Imagination: Factors Affecting the Creativity of Marketing Programs for mature Products," *Journal of Marketing Research*, 33 (May), 174-187.

Argyris, C. and Schön, D.A. (1978), *Organizational Learning: A Theory of Action Perspective.* Reading, MA: Addison-Wesley.

Ashby, W.R. (1956), *An Introduction to Cybernetics.* London: Chapman&Hall.

Aslanides, E. (1997), *Anamnisis Tragon.* Athens: Ikaros.

Babbie, E. (1990), *Survey Research Methods.* Belmont: Wadsworth.

Baker, W.E. and Sinkula, J.M. (1999), "The Synergistic Effect of Market Orientation and Learning Orientation on Organizational Performance," *Journal of the Academy of Marketing Science*, 27 (4), 411-427.

Bantel, K.A. and Jackson, S.E. (1989), "Top Management and Innovations in Banking: Does the Composition of the Top Management Team Make a Difference?," *Strategic Management Journal*, 10, 107-124.

Barker, R.T. and Camarata, M.R. (1998), "The Role of Communication in Creating and Maintaining a Learning Organization: Preconditions, Indicators, and Disciplines," *The Journal of Business Communication*, 35 (4), 443-467.

Barr, P.S., Stimpert, J.L., and Huff, A.S. (1992), "Cognitive Change, Strategic Action, and Organizational Renewal," *Strategic Management Journal*, 13, 15-36.

Berthon, P. (2000), "The Role of the Internet in Becoming Market Oriented: An International Perspective," *Working Paper*, University of Bath.

Berthon, P. (1993), "Psychological Type and Corporate Culture: Relationship and Dynamics," *OMEGA: International Journal of Management Science*, 21 (3): 329-344.

Bettis, R.A. and Prahalad, C.K. (1995), "Dominant Logic: Retrospective and Extension," *Strategic Management Journal*, 16 (1), 5-14.

Beyer, J. M. and Trice, H.M. (1982), "The Utilization Process: A Conceptual Framework and Synthesis of Empirical Findings," *Administrative Science Quarterly*, 27 (December), 592-622.

Bourgeois, L. J. (1985), "Strategic Goals, Perceived Uncertainty, and Economic Performance in Volatile Environments," *Academy of Management Journal*, 28: 548-573.

Burgelman, R.A. (1991), "Intraorganizational Ecology of Strategy Making and Organizational Adaptation: Theory and Field Research," *Organization Science*, 2 (3), 239-262.

Burns, A.C. and Bush, R.F. (1995), *Marketing Research.* Englewood Cliffs, NJ: Prentice Hall.

Calder, B. (1994), "Qualitative Market Research," in Bagozzi, R., ed., *Principles of Marketing Research.* Oxford: Blackwell.

Caruana, A., Pitt, L. and Berthon, P. (1999), "The Excellence-Market Orientation Link: Its Foundations and Relevance to Theory Building and Research in Marketing," *Journal of Business Research*, 44 (1): 5-15.

Choo, C.W. (1998), *The Knowing Organization: How Organizations Use Information to Construct Meaning, Create Knowledge, and Make Decisions.* New York, NY: Oxford University Press.

Churchill, G. (1995), *Marketing Research: Methodological Foundations.* Fort Worth, TX: The Dryden Press.

_____ (1991), *Marketing Research: Methodological Foundations.* Chicago, IL: The Dryden Press.

_____ (1978), "A Paradigm for Developing Better measures of marketing Constructs," *Journal of Marketing Research*, XVI (February), 64-73.

Churchman, C.W. (1971), *The Design of Inquiring Systems.* New York, NY: Basic Books.

Cohen, W.M. and Levinthal, D.A. (1990), "Absorptive Capacity: A New Perspective on Learning and Innovation," *Administrative Science Quarterly*, 35, 128-152.

_____ and _____ (1994), "Fortune Favors the Prepared Firm," *Management Science*, 40: 227-251.

_____ and Bacdayan, P. (1994), "Organizational Routines are Stored as Procedural memory: Evidence from a Laboratory Study," *Organization Science*, 5 (4), 554-568.

Collins, B.E. and Guetzkow, H. (1964), *A Social Psychology of Group processes for Decision-Making.* New York, NY: John Wiley.

Comer, J.M. and Kelly, J.S. (1982), "Follow-Up Techniques: The Effect of Method and Source Appeal," *American Marketing Association Conference Proceedings*, 430-434.

Corner Doyle, P. Kinicki, A.J., and Keats, B.W. (1994), "Integrating Organizational and Individual Information processing Perspectives on Choice," *Organization Science*, 5 (3), 294-308.

Creswell, J. W. (1994), *Research Design: Qualitative and Quantitative Approaches.* Thousand Oaks, CA: Sage Publications.

Crossan, M.M., Lane, H.W., and White, R.E. (1999), "An Organizational Learning Framework: From Intuition to Institution," *Academy of Management Review*, 24 (3), 522-537.

Curren, M.T., Folkes, V.S., and Steckel, J.H. (1992), "Explanations for Successful and Unsuccessful Marketing Decisions: The Decision Maker's Perspective," *Journal of Marketing*, 56 (April), 18-31.

Cyert, R.M. and March, J.G. (1992), *A Behavioral Theory of the Firm*. Oxford: Blackwell.

Daft, R.L. and Huber, G.P. (1987), "How Organizations Learn: A Communication Framework," *Research in the Sociology of Organizations*, 5, 1-36.

_____ and Lengel, R.H. (1986), "Organizational Information Requirements, Media Richness and Structural Design," *Management Science*, 32, 554-571.

_____ and Weick, K. E. (1984), "Toward a Model of Organizations as Interpretation Systems," *Academy of Management Review*, 9 (2), 284-295.

_____ and Macintosh, R.L. (1981), "A Tentative Exploration into the Amount and Equivocality of Information Processing in Organizational Work Units," *Administrative Science Quarterly*, 26 (June), 207-224.

_____, Sormunen, J., and Parks, D. (1988), "Chief Executive Scanning, Environmental Characteristics, and Company Performance: An Empirical Study," *Strategic Management Journal*, 9, 129-139.

Daniel, W.W. and Terrell, J.C. (1986), *Business Statistics: Basic Concepts and Methodology*. Boston, MA: Houghton Mifflin.

Day, G.S. (1994), "Continuous Learning About Markets," *California Management Review*, 36 (Summer), 9-31.

_____ and Montgomery, D.B. (1999), "Charting New Directions for Marketing," *Journal of Marketing*, 63 (Special Issue), 3-13.

Davenport, T.H, De Long, D.W., and Beers, M.C. (1998), "Successful Knowledge Management Projects," *Sloan Management Review*, (Winter), 43-57.

De Vaus, D. (1986), *Surveys in Social Research*. London: George Allen & Unwin.

Dean, J.W. Jr. and Sharfman, M.P. (1996), "Does Decision Process Matter? A Study of Strategic Decision Making Effectiveness," *Academy of Management Journal*, 39 (2), 368-396.

_____ and _____ (1993), "The Relationship of Procedural Rationality and Political Behavior in Strategic Decision-Making, *Decision Sciences*, 24, 1069-1083.

Denison, D.R., Dutton, J.E., Kahn, J.A. and Hart, S.L. (1996), "Organizational Context and the Interpretation of Strategic Issues: A Note on CEOs' Interpretations of Foreign Investment," *Journal of Management Studies*, 33 (4), 453-474.

Desphandé, R. (1982), "The Organizational Context of Market Research Use," *Journal of Marketing,* 46 (Fall), 91-101.

_____ and Webster, F.E. Jr. (1989), "Organizational Culture and Marketing: Defining the Research Agenda," *Journal of Marketing*, 53 (January), 3-15.

_____ and Kohli, A.K. (1989), "Knowledge Disavowal," *Knowledge, Diffusion, Utilization*, 11 (2), 155-169.

_____ and Zaltman, G. (1984), "A Comparison of Factors Affecting Researcher and Manager Perceptions of Market Research Use," *Journal of Marketing Research*, 21 (February), 32-38.

_____ and _____ (1982), "Factors Affecting the Use of Market Research Information: A Path Analysis," *Journal of Marketing Research*, 19 (February), 14-31.

_____, Farley, J.U and Webster, F.E. (1993), "Corporate Culture, Customer Orientation and Innovativeness in Japanese Firms: A Quadrad Analysis," *Journal of Marketing*, 57 (January), 23-27.

Dess, G. and Beard D. (1984), "Dimensions of Organizational Task Environments", *Administrative Science Quarterly*, 29, 52-73.

Diamantopoulos, A. and Schlegelmilch, B.B. (1997), *Taking the Fear out of Data Analysis*. London: The Dryden Press.

Dixon, N.M. (1999), *The Organizational Learning Cycle: How we Can Learn Collectively*. Hampshire: Gower.

_____ (1992), "Organizational Learning: A Review of the Literature with Implications for HRD Professionals," *Human Resource Development Quarterly,* 3 (Spring), 19-47.

Dodgson, M. (1993), "Organizational Learning: A Review of Some Literatures," *Organizational Studies*, 14 (3), 375-394.

Donaldson, G. and Lorsch, J.W. (1983), *Decision Making at the Top.* New York, NY: Basic Books.

Donnellon, A., Gray, B., and Bougon, M.G. (1986), "Communication, Meaning, and Organized Action," *Administrative Science Quarterly*, 31 (March), 43-55.

Dooley, R.S. and Fryxell G.E. (1999), "Attaining Decision Quality and Commitment from Dissent: The Moderating Effects of Loyalty and Competence in Strategic Decision-Making Teams," *Academy of Management Journal*, 42 (4), 389-402.

Drucker, P.F. (1993), *Post-Capitalist Society.* New York, NY: Harper Collins.

Duncan, R. and Weiss, A. (1979), "Organizational Learning: Implications for Organizational Design," *Research in Organizational Behavior*, 1, 75-123.

Dunn, W.N. (1980), "The Two-Communities Metaphor and Models of Knowledge Use," *Knowledge: Creation, Diffusion, Utilization*, 1 (4), 515-536.

Dutton, J.E. and Jackson, S.B. (1987), "Categorizing Strategic Issues: Links to Organizational Action," *Academy of Management Review*, 12, 76-90.

_____, Fahey, L. and Narayanan, V.K. (1983), "Toward Understanding Strategic Issue Diagnosis," *Strategic Management Journal*, 4, 307-323.

Eisenhardt, K. and Bourgeois, L.J. (1988), "Politics of Strategic Decision Making in High-Velocity Environments: Toward a Midrange Theory," *Academy of Management Journal*, 31, 737.

Fahey, L. and Narayanan, K. (1986), *Macroenvironmnetal Analysis for Strategic Analysis.* St. Paul, NJ: West Publishing Company.

Farley, J.U., Hulbert, J.M., and Weinstein, D. (1980), "Price Setting and Volume Planning by Two European Industrial Companies: A Study of Decision Processes," *Journal of Marketing*, 44 (Winter), 46-54.

Feldman, M. and March, J. (1981), "Information in Organizations as Signal and Symbol," *Administrative Science Quarterly*, 26, 171-186.

Fiol, M.C. (1994), "Consensus, Diversity, and Learning in Organizations," *Organization Science*, 5 (3), 403-421.

_____ and Lyles, M.A. (1985), "Organizational Learning," *Academy of Management Review,* 10 (4), 803-813.

Ford, C.M. and Ogilvie, D.T. (1996), "The Role of Creative Action in Organizational Learning and Change," *Journal of Organizational Change Management*, 9 (1), 54-62.

Franwick, G.L., Ward, J.C., Hutt, M.D. and Reingen, P.H. (1994), "Evolving Patterns of Organizational Beliefs in the Formation of Strategy," *Journal of Marketing*, 58 (April), 96-110.

Fredrickson, J,W. (1986), "An Exploratory Approach to Measuring Perceptions of Strategic Decision Process Constructs, *Strategic Management Journal*, 7 (September – October), 473-483.

_____ (1984), "The Comprehensiveness of Strategic Decision Processes: Extension, Observations, Future Directions," *Academy of Management Journal*, 27 (3), 445-466.

Friedlander, F. (1983), "Patterns of Individual and Organizational Learning," in *The Executive Mind*, S. Srivastava, ed. San Francisco, CA: Jossey-Bass, 192-220.

Garvin, D.A. (1993), "Building a Learning Organisation," *Harvard Business Review*, 71 (July-August), 78-91.

Gioia, D.A. and Manz, C.C. (1985), "Linking Cognition and Behavior: A Script Processing Interpretation of Vicarious Learning," *Academy of Management Review*, 10 (3), 527-539.

_____ and Sims, H.P. Jr. (1986), "Introduction: Social Cognition in Organizations," in *The Thinking Organization*, H.P. Sims and D.A. Gioia, eds., San Francisco, CA: Jossey-Bass, 1-19.

Glazer, R. (1991), "Marketing in an Information-Intensive Environment: Strategic Implications of Knowledge as an Asset," Journal of Marketing, 55 (October), 1-19.

Goldstein, M., Marcus, A., and Rausch, N. (1978), "The Nonutilization of Utilization Research," *Pacific Sociological Review*, 21, 21-44.

Grant, R.M. (1996), "Toward a Knowledge-Based Theory of the Firm," *Strategic Management Journal*, 17 (Winter Special Issue), 109-122.

Gupta, A. K., Raj, S.P., and Wilemon, D. (1985), "R&D and marketing Dialogue in High-Tech Firms," *Industrial Marketing Management*, 14 (November), 289-300.

Hair, J.F. Jr., Anderson, R.E., Tatham, R.L., and Black, W.C. (1998), *Multivariate Data Analysis.* New Jersey: Prentice Hall.

Hakim, C. (1987), *Research Design: Strategies and Choices in the Design of Social Research.* London: Allen & Unwin.

Hambrick, D., and Mason, P.A. (1984), "Upper Echelons: The Organization as a Reflection of its Top Management Team," *Academy of Management Review*, 9, 193-206.

Harris, S.G. (1994), "Organizational Culture and Individual Sensemaking: A Schema-based Perspective," *Organization Science*, 5 (3) 309-321.

Harvey, L. (1987), "Factors affecting Response rates to mailed Questionnaires: A Comprehensive Literature Review," *Journal of the Market Research Society*, 29 (3), 341-353.

Hattie, J. (1985), "Methodology Review: Assessing Unidimensionality of Tests and Items," *Applied Psychological Measurement*, 9 (2) 139-164.

Havelock, R.G. (1986), "The Knowledge Perspective: Definition and Scope of a New Study Domain," in *Knowledge Generation, Exchange, and Utilization*, G.M. Beal, W. Dissanayake, and S. Konoshima, eds. Boulder: Westview Press, 11-34.

Hedberg, B. (1981), "How Organizations Learn and Unlearn," in *Handbook of Organizational Design,* P.C. Nystrom and W.H. Starbuck, eds. London: Oxford University Press.

Herbick, P.A. and Kramer, H. (1994), "The Effect of Information Overload on the Innovation Choice Process: Innovation Overload," *Journal of Consumer Marketing*, 11 (2), 45-54.

Hickson, D.J., Butler, R.J., Gray, D., Mallory, G.R., and Wilson, D.C. (1986), *Top Decisions: Strategic Decision-Making in Organizations.* San-Francisco, CA: Jossey Bass.

Holland, J.H. (1992), *Adaptation in Natural and Artificial Systems.* Cambridge, MA: MIT Press.

Howard, J.A., Hulbert, J.M., and Farley J.U. (1975), "Organizational Analysis and Information Systems Design: A Decision Process Perspective," *Journal of Business Research*, 2 (April), 138-148.

Huber, G. (1991), "Organizational Learning: The contributing processes and the literatures," *Organizational Science*, 2 (1), 88-115.

_____ and Daft, R. (1987), "The Information Environment of Organizations," in *Handbook of Organizational Communications: An Interdisciplinary Perspective*, F. Jablin, L.L. Putnam, K.H. Roberts, and L.W. Porter, eds. Newbury Park, CA: Sage Publications, 389-419.

Hulbert, J.M. (1981), "Descriptive Models of Marketing Decisions," in *Marketing Decision Models*, R.J. Schultz and A.A. Zoltners, eds. New York, NY: Elsevier North Holland.

Hult, G.T. (1998), "Managing the International Strategic Sourcing Process as a Market-driven Organizational Learning System," *Decision Sciences*, 29 (Winter), 193-216.

_____ and Ferrell, O.C. (1997), "Global Organizational Learning Capacity in Purchasing: Construct and Measurement," *Journal of Business Research*, 40, 97-111.

Hurley, R.F. and Hult, G. T. (1998), "Innovation, Market Orientation and Organizational Learning: An Integration and Empirical Investigation," *Journal of Marketing*, 62 (July), 42-54.

Hurst, D.K., Rush, J.C., and White, R.E. (1989), "Top Management Teams and Organizational Renewal," *Strategic Management Journal*, 10, 87-105.

Isabella, L.A. (1990), "Evolving Interpretations as a Change Unfolds: How Managers Construe Key Organizational Events," *Academy of Management Journal*, 33 (1), 7-41.

Janis, I. (1982), *Groupthink: Psychological Studies of Policy Decision.* Boston, MA: Houghton Mifflin.

Jaworski, B.J. and Kohli, A.K. (1993), "Market Orientation: Antecedents and Consequences," *Journal of Marketing*, 57 (July), 53-70.

Jobber, D. and Saunders, J. (1993), "A Note on the Applicability of the Bruvolt-Comer Model of Mail Survey Response rates to Commercial Populations," *Journal of Business Research*, 26, 223-236.

John, G. and Martin, J. (1984), "Effects of Organizational Structure of Marketing Planning on Credibility and Utilization of Plan Output," *Journal of Marketing Research*, 21 (May), 170-183.

Kahn, K.B. (1996), "Interdepartmental Integration: A Definition with Implications for Product Development Performance," *Journal of Product Innovation Management*, 13 (2), 137-151.

Kerlinger, F. N. (1986), *Foundations of Behavioral Research* New York: Holt, Rinehart, and Winston.

Kiesler, S. and Sproull, L. (1982), "Managerial Response to Changing Environments: Perspectives on Problem Sensing from Social Cognition," *Administrative Science Quarterly*, 27 (December), 548-570.

Kim, J.O. and Mueller, C.W. (1978), *Factor Analysis: Statistical Methods and Practical Issues.* Beverly Hills, CA: Sage Publications.

Kinnear, T. and Taylor, J. (1991), *Marketing Research: Applied Approach.* New York, NY: McGraw-Hill.

Kleinbaum, D.G., Kupper, L.L., and Müller, K.E. (1988), *Applied Regression Analysis and Other Multivariate Methods.* Boston, MA: PWS-Kent Publishing Company.

Knorr, K.D. (1977), "Policymakers' Use of Social Science Knowledge: Symbolic or Instrumental?," in *Using Social Research in Public Policy Making*, C.H. Weiss, ed. Lexington Books: DC Heath and Company.

Kohli, A.K. and Jaworski, B.J. (1990), "Market Orientation: The Construct, Research Propositions and Managerial Implications," *Journal of Marketing,* 54, (April), 1-18.

Krausz, E. and Miller, S. (1974), *Social Research Design.* New York, NY: Longman.

Lant, T. K. and Milliken, F.J. (1992), "The Role of Managerial Learning and Interpretation in Strategic Persistence and Reorientation: An Empirical Exploration," *Strategic Management Journal*, 13, 585-608.

Lawrence, P.R. and Lorsch, J.W. (1984), *Organization and Environment.* Boston, MA: Harvard Business School Press.

Leonard, D. (1998), *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation.* Boston, MA: Harvard Business School Press.

Leslie, L.L (1972), "Are High Response Rates Essential to Valid Surveys?," *Social Science Research*, 1, 323-334.

Levitt, B. and March, J.G. (1988), "Organizational Learning," in *Annual Review of Sociology*, W.R. Scott and J. Black, eds. Palo Alto, Ca: Annual Reviews Inc., 319-340.

Li, T. and Calantone R.J. (1998), "The impact of market knowledge competence on new product advantage: Conceptualization and empirical examination," *Journal of Marketing*, 62 (4): 13-29.

Luck, D.J. and Rubin, R.S. (1987), *Marketing Research.* Englewood Cliffs, NJ: Prentice Hall.

Maltz, E. and Kohli, A. (1996), "Market Intelligence Dissemination Across Functional Boundaries," *Journal of Marketing Research*, 33 (February), 47-61.

March, J.G. (1991), "Exploration and Exploitation in Organizational Learning," *Organization Science*, 2 (February), 71-78.

Menon, A., Bharadwaj, S.G., Adidam, P.T., and Edison S.W. (1999), "Antecedents and Consequences of Marketing Strategy Making: A Model and a Test," *Journal of Marketing*, 63 (April): 18-40.

_____, _____, and Howell, R. (1996) "The Quality and Effectiveness of Marketing Strategy: Effects of Functional and Dysfunctional Conflict in Intraorganizational Relationships", *Journal of the Academy of Marketing Science*, 24 (4), 299-313.

_____ and Varadarajan, R. (1992), "A Model of Marketing Knowledge Use Within Firms," *Journal of Marketing*, 56 (October), 53-71.

Miller, D. (1987), "The Structural and Environmental Correlates of Business Strategy," *Strategic Management Journal*, 8 (January – February), 55-76.

Miller, C.C., Burke, L.M. and Glick, W.H. (1998), "Cognitive Diversity Among Upper-Echelon Executives: Implications For Strategic Decision Processes," *Strategic Management Journal*, 19, 39-58.

Milliken, F.J. (1990), "Perceiving and Interpreting Environmental Change: An Examination of College Administrators' Interpretation of Changing Demographics," *Academy of Management Journal*, 33 (1), 42-63.

Mintzberg, H. (1978), "Patterns in Strategy Formation," *Management Science*, 24, 8.

_____, Raisinghani, D., and Theoret, A. (1976), "The Structure of "Unstructured" Decision Processes," *Administrative Science Quarterly*, 21 (2), 246-75.

Moorman, C. (1995), "Organizational Market Information Processes: Cultural Antecedents and New Product Outcomes," *Journal of Marketing Research,* 32, (August) 318-335.

_____ and Rust, R.T. (1999), "The Role of Marketing," *Journal of Marketing*, 63 (Special Issue), 180-197.

_____ and Miner, A.S. (1997), "The Impact of Organizational Memory on New Product Performance and Creativity," *Journal of Marketing Research,* 34 (February), 91-106.

_____ and _____ (1998), "Organizational Improvisation and Organizational Memory," *Academy of Management Review*, 23 (4), 698-723.

_____, Zaltman, G. and Desphande, R. (1992), "Relationships Between Providers and Users of Market Research: The Dynamics of Trust Within and Between Organizations," *Journal of Marketing Research*, 29 (August), 314-329.

Nachmias – Frankfort, C. and Nachmias, D. (1996), *Research Methods in the Social Sciences.* London: Arnold.

Nevis, E.C., DiBella, A.J., and Gould, J.M. (1995), "Understanding Organizations as Learning Systems," *Sloan Management Review*, (Winter), 73-85.

Nonaka, I. (1991), "The Knowledge-Creating Company," *Harvard Business Review*, 69 (November-December), 96-104.

_____ and Takeuchi, H. (1995), *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation.* New York: Oxford University Press.

Nunally, J.C. (1978), *Psychometric Theory.* New York, NY: McGraw-Hill.

Nutt, P.C. (1998), "Framing Strategic Decisions," *Organization Science*, 9 (2), 195-216.

_____ (1993), "The Formulation Processes and Tactics Used in Organizational Decision Making," *Organization Science*, 4 (2), 336-251.

Nystrom, P.C. and Starbuck, W.H. (1984), "To Avoid Organizational Crises, Unlearn," *Organizational Dynamics*, (Spring), 53-65.

O'Reilly, C.A., III (1983), "The Use of Information in Organizational Decision Making: A Model and Some Propositions," *Research in Organizational Behavior*, 5, 103-139.

_____ (1982), "Variations in Decision Makers' Use of Information Sources: The Impact of Quality and Accessibility of Information," *Academy of Management Journal*, 25 (4), 756-771.

Oppenheim, A.N. (1992), *Questionnaire Design, Interviewing and Attitude Measurement*. London: Pinter Publishers.

Ottum, B. and Moore, W.L. (1997), "The Role of Market Information in New Product Success/Failure," *Journal of Product Innovation Management*, 14, 258-273.

Parasuraman, A. (1986), *Marketing Research*. Reading, MA: Addison-Wesley.

Peter, J.P. (1979), "Reliability: A Review of Psychometric Basics and Recent Marketing Practices," *Journal of UK Research*, 16 (February), 6-17.

Peterson, R.A. (1988), *Marketing Research*. Texas: Business Publications.

Pfeffer, J. (1981), *Power in Organizations*. Marshfield, MA: Pitman.

Pfeffer, J. and Salancik, G.R. (1978), *The External Control of Organizations: A Resourse Dependence Perspective* New York: Harper & Row.

Philips, L.W. (1981), "Assessing Measurement Error in key Informant Reports: A Methodological Note on Organizational Analysis in Marketing," *Journal of Marketing Research*, 17 (November), 395-415.

Polanyi, M. (1983), *The Tacit Dimension*. Gloucester, MA: Peter Smith.

Prabhu, J. and Stewart, D.W. (Forthcoming), "Signaling Strategies in Competitive Interaction: Building Reputations and Hiding the Truth," *Journal of Marketing Research*.

Prahalad, R.A. and Bettis, R.A. (1986), "The Dominant Logic: A New Linkage between Diversity and Performance," *Strategic Management Journal*, 7 (6) , 485-501.

Quinn, J.B. (1980), *Strategies for Change: Local Incrementalism*. Homewood, IL: Irwin.

Rajagopalan, N. and Spreitzer, G.M. (1999), "Toward a Theory of Strategic Change: A Multi-lens Perspective and Integrative Framework," Academy of Management Review, 22 (1), 48-80.

Revans, R.W. (1980), *Action Learning: New Techniques for Management.* London: Blond & Briggs.

Rich, R.F. (1979), *The Power of Social Science Information and Public Policy-Making: The Case of the Continuous National Survey.* San Francisco, CA: Jossey-Bass.

Rogers, E.M. (1983), *Diffusion of Innovations.* New York: The Free Press.

Sackmann, S.A. (1992), Culture and Subcultures: An Analysis of Organizational Knowledge," *Administrative Science Quarterly*, 37 (March), 140-161.

Salancik, G.R. and Pfeffer (1978), "A Social Information Processing Approach to Job Attitudes and Task Design," *Administrative Science Quarterly*, 23 (2), 224-253.

Schein, E.H. (1996), "Three Cultures of Management: The Key to Organizational Learning," *Sloan Management Review*, (Fall), 9-20.

_____ (1992), *Organizational Culture and Leadership.* San Francisco, CA: Jossey-Bass.

Schön, D.A. (1979), "Organizational Learning," in Beyond Method: Strategies for Social Research, G. Morgan, ed. Newbury Park: Sage, 114-127.

Schweiger, D.M., Sandberg, W.R., and Rechner, P.L. (1989), "Experiential Effects of Dialectical Inquiry, Devil's Advocacy and Consensus Approaches to Strategic Decision Making," *Academy of Management Journal*, 32 (4), 745-772.

_____, _____, and Ragan, J. W. (1986), "Group Approaches for Improving Strategic Decision making: A Comparative Analysis of Dialectic Inquiry, Devil's Advocacy, and Consensus," *Academy of Management Journal*, 29 (1), 51-71.

Schwenk, C.R. (1988), *The Essence of Strategic Decision Making.* Lexington, MA: Lexington Books.

Senge, P. M. (1990), *The Fifth Discipline: The Art and Practice of the Learning Organization.* New York: Currency Doubleday.

Sharfman, M.P. and Dean, J.W. Jr. (1997), "Flexibility in Strategic Decision Making: Informational and Ideological Perspectives," *Journal of Management Studies*, 34 (2), 191-217.

Sharkey, T.W., Kim, K.I., and Lim, J.S. (1989), "Export Development and Perceived Export Barriers: An Empirical Analysis of Small Firms," *Management International Review*, v29 (2), 33-41.

Sharma, S. (1996), *Applied Multivariate Techniques*. New York, NY: John Willey & Sons, Inc.

Shrivastava, P (1987), "Rigor and Practical Usefulness of Research in Strategic Management," *Strategic Management Journal*, 8, 77-92.

_____ and Mitroff, I.I. (1984), "Enhancing Organizational Research Utilization: The Role of Decision Makers' Assumptions," *Academy of Management Review*, 9 (1), 18-26.

_____ and Schneider, S. (1984), "Organizational Frames of Reference," *Human Relations*, 37 (10), 795-809.

Silver, M. (1992), *Business Statistics*. London: McGraw-Hill.

Sinkula, J.M. (1994), "Market Information Processing and Organizational Learning," *Journal of Marketing,* 58 (January), 35-45.

_____ (1990), "Perceived Characteristics, Organizational Factors, and the Utilization of External Market Research Suppliers," *Journal of Business Research, 21* (August), 1-17.

_____, Baker, W.E. and Noordewier, T. (1997), "A Framework for Market-Based Organizational Learning: Linking Values, Knowledge and Behavior," *Journal of the Academy of Marketing Science*, 25 (4), 305-318.

Slater, S.F. and Narver, J.C. (1995), "Market Orientation and the Learning Organization," *Journal of Marketing*, 59 (July), 63-74.

Spector, P.E. (1992), *Summated Rating Scale Construction: An Introduction.* Quantitative Approaches in the Social Sciences, Series No. 07-082, Newbury Park: Sage.

Spender, J.C. (1996), "Making Knowledge the Basis of a Dynamic Theory of the Firm," *Strategic Management Journal*, 17 (Winter Special Issue), 45-62.

Stata, R. (1989), "Organizational Learning – The Key to Management Innovation," *Sloan Management Review*, (Spring), 63-74.

Sternthal, B. and Craig, S.S. (1982), *Consumer Behavior: An Information Processing Perspective.* Englewood Cliffs, NJ: Prentice-Hall.

Swenk, C.R. (1995), "Strategic Decision Making," *Journal of Management*, 21 (3), 471-93.

Thomas, J.B. and McDaniel, R.R. Jr. (1990), "Interpreting Strategic Issues: Effects of Strategy and the Information-Processing Structure of Top Management Teams," *Academy of Management Journal*, 33 (2),286-306.

_____, Shankster, L.J., and Mathieu, J.E. (1994), "Antecedents to Organizational Issue Interpretation: The Roles of Single-Level, Cross-Level, and Content Cues," *Academy of Management Journal*, 37 (5), 1252-1284).

_____, Clark, S.M. and Gioia, D.A. (1993), "Strategic Sensemaking and Organizational Performance: Linkages Among Scanning, Interpretation, Action and Outcomes," *Academy of Management Journal*, 36 (2), 239-270.

Thomas, K.W. and Tymon, W.G. Jr. (1982), "Necessary Properties of Relevant Research: Lessons from Recent Criticisms of the Organizational Sciences," *Academy of Management Review*, 7 (3), 345-352.

Tushman, M.L. and Nadler, D.A. (1978), "Information Processing as an Integrating Concept in Organizational Design," *Academy of Management Review*, (July), 613-624.

Tull, D.S. and Hawkins, D.I. (1993), *Marketing Research: Measurement and Method.* New York: MacMillan.

Tversky, A. and Kahneman, D. (1981), *"The Framing of Decisions and the Psychology of Choice,"* Science, 211, 453-458.

Van de Ven, A. and Ferry, D. (1980), *Measuring and Assessing Organizations.* New York, NY: John Wiley & Sons, Inc.

Walsh, J.P. (1995), "Managerial and Organizational Cognition: Notes from a Trip down Memory Lane," *Organization Science*, 6 (3), 280-321.

_____ (1988), "Selectivity and Selective Perception: An Investigation of Managers' Belief Structures and Information Processing," *Academy of Management Journal*, 31 (4), 873-896.

_____ and Ungson, G.R. (1991), "Organizational Memory," *Academy of Manegement Review*, 16 (1), 57-91.

_____, Henderson, C.M., and Deighton, J. (1988), "Negotiated Belief Structures and Decision Performance: An Empirical Investigation," *Organizational Behavior and Human Decision Processes*, 42, 194-216.

_____ and Fahey, L. (1986), "The Role of Negotiated Belief Structures in Strategy Making," *Journal of Management*, 12, 325-338.

Watson, W.E. and Michaelsen, L.K. (1988), "Group Interaction Behaviors that Affect Group Performance on an Intellective Task," *Group & Organization Studies*, 13 (4), 495-516.

Weick, K.E. (1979), "Cognitive Processes in Organizations," in *Research in Organizational Behavior*, B.M. Staw, ed. New York, NY: Random House.

_____ (1995), *Sensemaking in Organizations*. Thousand Oaks, CA: Sage.

Weiss, A. and Heide, J. (1993), "The Nature of Organizational Search in High Technology Markets," *Journal of Marketing Research*, 30 (May), 220-233.

Weiss, C.H. and Bucuvalas, M.J. (1980), "Truth Tests and Utility Tests: Decision-Makers' Frames of Reference for Social Science Research," *American Sociological Review*, 45 (April), 302-313.

Wilton, P.C. and Myers, J. G. (1986), "Task, Expectancy and Information Assessment Effects in Information Utilization Processes," *Journal of Consumer Research*, 12 (March), 469-487.

Wooldridge, B. and Floyd, S.W. (1990), " The Strategy Process, Middle Management Involvement, and Organizational Performance," *Strategic Management Journal*, 11, 231-241.

Yi, Y. (1990), "The Effects of Contextual Priming in Print Advertisements," *Journal of Consumer Research*, 17 (2), 215-22.

Zaltman, G. (1986), "Knowledge Utilization as Planned Social Change", in *Knowledge Generation, Exchange, and Utilization*, G.M. Beal, W. Dissanayake, and S. Konoshima, eds. Boulder: Westview Press, 433-460.

_____, Duncan, R., and Holbek, J. (1973), Innovations and Organizations. New York, NY: John Wiley.

APPENDIX I

PRE-TEST

APPENDIX I

PRE-TEST

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❖ *Appendix I.1 Pre-test Questionnaire*

MARKET INFORMATION & DECISION MAKING

Thank you for taking the time to complete this questionnaire. Your responses are confidential and will be used in a research study concerning market information and decision-making. For each of the statements listed below, please indicate the extent to which you agree or disagree by circling the appropriate number on the scale, where 1 indicates strong disagreement and 7 strong agreement. The questionnaire should take you about 20 minutes to complete.

SECTION I: DECISION MAKING

1.For every question we need you to refer to a specific strategic marketing decision that you participated in. Please briefly describe below the most recent strategic marketing decision that was made and implemented in your company, and for which performance indications are available:

.....

.....

.....

1. In terms of the value of this decision, please indicate the extent to which you agree or disagree with the following statements:

	Strongly Disagree						Strongly Agree
1. The decision achieved the intended results.	1	2	3	4	5	6	7
2. The decision added significant value to the organization.	1	2	3	4	5	6	7
3. The decision was sound.	1	2	3	4	5	6	7
4. This was a high quality decision.	1	2	3	4	5	6	7

2. In evaluating the timeliness of the decision, please indicate the extent to which you agree or disagree with the following statements:

	Strongly Disagree						Strongly Agree
1. The decision was current and topical	1	2	3	4	5	6	7
2. The decision was made and implemented in a timely manner.	1	2	3	4	5	6	7
3. The decision was well timed.	1	2	3	4	5	6	7
4. It took too much time to implement the decision	1	2	3	4	5	6	7

3. Thinking about the overall appropriateness of the decision, please indicate the extent to which you agree or disagree with the following statements:

	Strongly Disagree						Strongly Agree
1. The decision was consistent with the overall strategy.	1	2	3	4	5	6	7
2. The decision was appropriate given the organization's situation.	1	2	3	4	5	6	7
3. The decision was part of the marketing plan.	1	2	3	4	5	6	7
4. The decision appropriately addressed the problems facing the organization.	1	2	3	4	5	6	7
5. The decision was well aligned with the objectives of the organization.	1	2	3	4	5	6	7
6. The decision was compatible with the mission of the organization.	1	2	3	4	5	6	7

4. Concerning the implementation of the decision, please indicate the extent to which you agree or disagree with the following statements:

	Strongly Disagree						Strongly Agree
1. The decision was completely adopted.	1	2	3	4	5	6	7
2. The decision was fully operationalized.	1	2	3	4	5	6	7
3. The decision was widely approved.	1	2	3	4	5	6	7
4. The decision was successfully implemented.	1	2	3	4	5	6	7
5. The decision was widely supported.	1	2	3	4	5	6	7
6. The implications of the decision were acceptable to everyone affected by the decision.	1	2	3	4	5	6	7
7. The implementation of the decision was unsuccessful.	1	2	3	4	5	6	7
8. The decision was widely acceptable.	1	2	3	4	5	6	7
9. The decision threatened existing assumptions.	1	2	3	4	5	6	7
10. The decision threatened existing arrangements.	1	2	3	4	5	6	7

5. In evaluating the creativity of this decision, please indicate the extent to which you agree or disagree with the following statements:

	Strongly Disagree						Strongly Agree
1. The decision included new aspects compared to previous decisions in the organization.	1	2	3	4	5	6	7
2. The decision was very different from others developed in the past in the organization.	1	2	3	4	5	6	7
3. The decision broke some of the "rules of the game" within the market.	1	2	3	4	5	6	7
4. The decision broke some of the "rules of the game" within the company	1	2	3	4	5	6	7
5. This decision was innovative.	1	2	3	4	5	6	7
6. Compared to previous, similar decisions, at least some parts were daring, risky, or bold.	1	2	3	4	5	6	7
7. The decision was very novel for the organization.	1	2	3	4	5	6	7
8. The decision offered new ideas to the organization.	1	2	3	4	5	6	7
9. The decision was creative.	1	2	3	4	5	6	7
10. The decision was uninteresting.	1	2	3	4	5	6	7
11. The decision spawned ideas for other/new strategies.	1	2	3	4	5	6	7
12. The decision encouraged fresh thinking.	1	2	3	4	5	6	7
13. The decision was inspiring.	1	2	3	4	5	6	7
14. The decision involved lateral thinking.	1	2	3	4	5	6	7

6. The process of decision-making involves employment of the organization's capital of relevant skills, stored knowledge and experience. Thinking about the level of your company's <u>expertise in making similar decisions</u>, compared to other firms in your industry, please indicate the extent to which you agree or disagree with the following statements.

	Strongly Disagree						Strongly Agree
1. There was a great deal of experience in the organization concerning similar decisions.	1	2	3	4	5	6	7
2. There was a great deal of familiarity with this kind of decision in the organization.	1	2	3	4	5	6	7
3. There was a considerable investment in research and new information collection for this decision.	1	2	3	4	5	6	7
4. There already existed a great deal of skill in making and implementing similar decisions in the organization.	1	2	3	4	5	6	7
5. There was a lot of expertise in making and implementing similar decisions.	1	2	3	4	5	6	7
6. There was a great amount of existing knowledge relevant to this decision.	1	2	3	4	5	6	7
7. There was a lot of know-how regarding the process of making and carrying out this decision.	1	2	3	4	5	6	7
8. There were specific mechanisms for sharing lessons learned during the decision making process.	1	2	3	4	5	6	7
9. There was auditing of past unsuccessful endeavours and communication of relevant experience among decision makers.	1	2	3	4	5	6	7
10. There was a good deal of conversation that kept alive the lessons learned from history.	1	2	3	4	5	6	7
11. There were formal routines used to uncover faulty assumptions that may have been made about the decision making process.	1	2	3	4	5	6	7
12. Existing knowledge was widely shared among decision makers.	1	2	3	4	5	6	7
13. Stored knowledge and experience were easily accessible during the decision making process.	1	2	3	4	5	6	7
14. Although relevant knowledge and skills to making and implementing this decision existed in the organization, it was difficult to obtain them.	1	2	3	4	5	6	7
15. It was easy to retrieve existing knowledge relevant to the decision making process.	1	2	3	4	5	6	7

SECTION II: USE OF MARKET INFORMATION IN DECISION MAKING

The process of making marketing decisions typically involves the collection and utilization of relevant market information. With reference to the marketing decision you described in Section I, please indicate the extent to which you agree or disagree with the following statements regarding the utilization of the collected market information below:

	Strongly Disagree						Strongly Agree
1. The information was suitable to the problem.	1	2	3	4	5	6	7
2. The information enriched my understanding about the decision.	1	2	3	4	5	6	7
3. No decision would have been made without the collected information.	1	2	3	4	5	6	7
4. The way I thought about the decision would have been very different without the collected information.	1	2	3	4	5	6	7
5. Information was helpful in resolving key issues of this decision.	1	2	3	4	5	6	7
6. The information added significantly to my knowledge.	1	2	3	4	5	6	7
7. The information was very appropriate to my needs.	1	2	3	4	5	6	7
8. The information was exactly what I required.	1	2	3	4	5	6	7
9. The information helped shape this decision.	1	2	3	4	5	6	7
10. The information reduced my uncertainty about the decision	1	2	3	4	5	6	7
11. The information improved implementation of this decision.	1	2	3	4	5	6	7
12. We relied on the information to make and implement this decision.	1	2	3	4	5	6	7
13. The information helped me identify aspects of the decision that I did not consider before.	1	2	3	4	5	6	7
14. The information provided distinct directions and led to concrete actions.	1	2	3	4	5	6	7
15. The ability to implement this decision would have been diminished without the information.	1	2	3	4	5	6	7

SECTION III: INTERPRETING INFORMATION FOR DECISION MAKING

Thinking about the content of the market information collected for the decision, please indicate the degree to which you agree or disagree with the following statements:

	Strongly Disagree						Strongly Agree
1. The meaning of the information was unclear.	1	2	3	4	5	6	7
2. The information conveyed conflicting signals.	1	2	3	4	5	6	7
3. The information contained many contradictory statements and findings	1	2	3	4	5	6	7
4. I found the information complex to analyze.	1	2	3	4	5	6	7
5. I found the information difficult to understand.	1	2	3	4	5	6	7
6. The information was inconclusive.	1	2	3	4	5	6	7
7. The information could be interpreted in many different ways.	1	2	3	4	5	6	7
8. The information lead to more than one solution.	1	2	3	4	5	6	7
9. The information meant different things to different people.	1	2	3	4	5	6	7

❖ ***Appendix I.2 Pre-test Factor & Reliability Analysis***

I.2.A Organizational Context Variables

➢ Organizational Memory

TABLE I.2.A1: FACTOR ANALYSIS FOR ORGANIZATIONAL MEMORY
Rotated Component Matrix

	Items	1	2	3	4	5
1	There was a great deal of experience in the organization concerning similar decisions.	.018	.756	.124	. 457	-.072
2	There was a great deal of familiarity with this kind of decision in the organization.	.312	.363	-.021	.835	-.006
3	There already existed a great deal of skill in making and implementing similar decisions in the organization.	.173	.799	-.075	.354	.081
4	There was a lot of know-how regarding the process of making and carrying out this decision.	.551	.678	-.070	-.002	-.010
5	There was a considerable investment in research and new information collection for this decision. (R)	-.073	-.060	-.667	-.192	-.502
6	There was a great amount of existing knowledge relevant to this decision.	.120	.518	.425	.246	-.107
7	There was a lot of expertise in making and implementing similar decisions.	.155	.919	.071	.164	-.002
8	There were specific mechanisms for sharing lessons learned during the decision making process.	.098	.113	.716	-.236	.191
9	There was auditing of past unsuccessful endeavours and communication of relevant experience among decision makers.	.288	-.106	-.119	-.063	.767
10	There was a good deal of conversation that kept alive the lessons learned from history.	.120	-.325	.509	.621	.248
11	There were formal routines used to uncover faulty assumptions that may have been made about the decision making process.	-.114	.089	.293	.003	.788
12	Existing knowledge was widely shared among decision makers.	.157	-.001	.862	.121	-.144
13	Stored knowledge and experience were easily accessible during the decision making process.	.840	.303	.234	.152	.084
14	Although relevant knowledge and skills to making and implementing this decision existed in the organization, it was difficult to obtain them.	.911	.073	.024	.053	.113
15	It was easy to retrieve existing knowledge relevant to the decision making process.	.885	.173	.217	.152	.006

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 8 iterations.

TABLE I.2.A2: RELIABILITY ANALYSIS FOR ORGANIZATIONAL MEMORY – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Corlation	Squared Multiple Correlation	Alpha if Item Deleted
1	There was a great deal of experience in the organization concerning similar decisions.	55.968	115.83	.470	.835	.750
2	There was a great deal of familiarity with this kind of decision in the organization.	56.218	111.91	.655	.876	.734
3	There already existed a great deal of skill in making and implementing similar decisions in the organization.	56.343	113.58	.564	.781	.742
4	There was a lot of know-how regarding the process of making and carrying out this decision.	55.406	114.24	.585	.693	.741
5	There was a considerable investment in research and new information collection for this decision. (R)	56.125	154.50	-.496	.721	.832
6	There was a great amount of existing knowledge relevant to this decision.	55.562	115.80	.542	.626	.745
7	There was a lot of expertise in making and implementing similar decisions.	56.312	112.86	.616	.832	.737
8	There were specific mechanisms for sharing lessons learned during the decision making process.	56.250	127.09	.225	.484	.771
9	There was auditing of past unsuccessful endeavours and communication of relevant experience among decision makers.	56.406	130.12	.103	.428	.782
10	There was a good deal of conversation that kept alive the lessons learned from history.	55.718	125.49	.254	.660	.769
11	There were formal routines used to uncover faulty assumptions that may have been made about the decision making process.	56.437	130.12	.099	.531	.782
12	Existing knowledge was widely shared among decision makers.	55.437	123.28	.285	.597	.767
13	Stored knowledge and experience were easily accessible during the decision making process.	56.125	107.66	.742	.842	.724
14	Although relevant knowledge and skills to making and implementing this decision existed in the organization, it was difficult to obtain them.	55.875	112.82	.557	.822	.742
15	It was easy to retrieve existing knowledge relevant to the decision making process.	56.250	113.61	.687	.824	.734

Reliability Coefficients 15 items
Alpha = .772
Standardized item alpha = .776

TABLE I.2A.3: RELIABILITY ANALYSIS FOR ORGANIZATIONAL MEMORY LEVEL – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlat	Squared Multiple Correlation	Alpha if Item Delted
1	There was a great deal of experience in the organization concerning similar decisions.	20.312	39.318	.646	.728	.850
2	There was a great deal of familiarity with this kind of decision in the organization.	20.562	39.479	.721	.751	.836
4	There already existed a great deal of skill in making and implementing similar decisions in the organization.	20.687	37.963	.762	.674	.828
5	There was a lot of expertise in making and implementing similar decisions.	20.656	38.168	.790	.752	.824
6	There was a great amount of existing knowledge relevant to this decision.	19.906	43.507	.507	.346	.872
7	There was a lot of know-how regarding the process of making and carrying out this decision.	19.750	42.064	.580	.511	.860

Reliability Coefficients 6 items
Alpha = .868
Standardized item alpha = .868

I.2.B Learning Process Variables

➢ Interpretive Content

TABLE I.2.B1: FACTOR ANALYSIS FOR INTERPRETIVE CONTENT
Rotated Component Matrix

	Items	1	2
1	The meaning of the information was unclear.	-.231	-.861
2	The information conveyed conflicting signals.	.797	.360
3	The information contained many contradictory statements and findings	.681	.583
4	I found the information complex to analyze.	.299	.855
5	I found the information difficult to understand.	-.261	-.895
6	The information was inconclusive.	-.681	-.273
7	The information could be interpreted in many different ways.	.876	.159
8	The information lead to more than one solution.	.809	.248
9	The information meant different things to different people.	.778	.225

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE I.2.B3: RELIABILITY ANALYSIS FOR INTERPRETIVE CONTENT – SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlatn	Squared Multiple Correlation	Alpha if Item Deleted
2	The information conveyed conflicting signals.	14.515	34.382	.779	.736	.886
3	The information contained many contradictory statements and findings	14.939	36.496	.767	.716	.888
7	The information could be interpreted in many different ways.	14.121	35.547	.782	.646	.885
8	The information lead to more than one solution.	13.878	35.047	.771	.614	.887
9	The information meant different things to different people.	13.697	35.842	.746	.618	.892

Reliability Coefficients 5 items
Alpha = .908
Standardized item alpha = .908

➢ Adaptation

TABLE I.2.B4: FACTOR ANALYSIS FOR ADAPTATION

Rotated Component Matrix

	Items	1	2	3	4
1	The information was suitable to the problem.	.834	.162	.296	-.028
2	The information enriched my understanding about the decision.	.784	.186	.287	-.010
3	No decision would have been made without the collected information.	.284	.022	-.071	.801
4	The way I thought about the decision would have been very different without the collected information.	.572	.599	.377	-.006
5	Information was helpful in resolving key issues of this decision.	.772	.330	.052	.327
6	The information added significantly to my knowledge.	.712	.256	.418	.174
7	The information was very appropriate to my needs.	.029	.919	-.175	.016
8	The information was exactly what I required.	.139	.784	.161	.067
9	The information helped shape this decision.	.341	.485	.673	.079
10	The information reduced my uncertainty about the decision	.111	-.167	.830	-.077
11	The information improved implementation of this decision.	.470	.192	.131	-.568
12	We relied heavily on the information to make and implement this decision.	.305	.336	.342	.569
13	The information helped me identify aspects of the decision that I did not consider before.	.741	.083	.127	.122
14	The information provided distinct directions and led to concrete actions.	.835	-.093	-.016	.184
15	The ability to implement this decision would have been diminished without the information.	.651	.534	-.160	-.190

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations.

TABLE I.2.B5: RELIABILITY ANALYSIS FOR ADAPTATION– SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corect Item-Total Correl	Squared Multiple Correlation	Alpha if Item Deleted
1	The information was suitable to the problem.	35.848	54.132	.839	.749	.887
2	The information enriched my understanding about the decision.	35.212	57.234	.811	.717	.891
4	The way I thought about the decision would have been very different without the collected information.	34.939	61.808	.728	.703	.901
5	Information was helpful in resolving key issues of this decision.	35.121	54.734	.806	.675	.890
6	The information added significantly to my knowledge.	35.818	54.153	.782	.732	.892
13	The information helped me identify aspects of the decision that I did not consider before.	35.424	60.126	.646	.470	.904
14	The information provided distinct directions and led to concrete actions.	35.787	57.109	.573	.437	.914
15	The ability to implement this decision would have been diminished without the information.	35.242	59.001	.592	.601	.909

Reliability Coefficients 8 items

Alpha = .910

Standardized item alpha = .916

I.2.C Decision Effectiveness Variables

➢ Decision Quality

TABLE I.2.C1: FACTOR ANALYSIS FOR DECISION QUALITY
Rotated Component Matrix

	Items	1	2	3	4	5
1	The decision achieved the intended results.	.847	.097	.080	.138	.196
2	The decision was sound.	.830	.236	-.045	.076	.199
3	The decision added significant value to the organization.	.905	.114	.121	.157	-.029
4	This was a high quality decision.	.844	-.012	.171	.138	.039
5	The decision was appropriate given the organization's situation.	.859	.160	.097	.079	-.092
6	The decision was current and topical.	.711	-.133	.177	393	-.235
7	The decision was made and implemented in a timely manner.	.877	.051	.203	-.003	.128
8	The decision was well timed.	.416	.008	.833	.197	.076
9	It took too much time to implement the decision.	.440	.177	-.538	.421	-.135
10	The decision was consistent with the overall strategy.	.846	.209	-.057	.160	-.130
11	The decision appropriately addressed the problems facing the organization	.797	.213	.130	-.113	.157
12	The decision was well aligned with the objectives of the organization	.849	.257	.155	.135	.107
13	The decision was part of the marketing plan.	.030	.672	.427	.269	.244
14	The decision was compatible with the mission of the organization.	-.149	.418	.549	.338	.248
15	The decision was completely adapted	.086	.429	.072	.202	.710
16	The decision threatened existing arrangements.	.045	.004	.430	.807	.061
17	The decision threatened existing assumptions.	.316	.190	.071	.785	.187
18	The decision was fully operationalized.	.267	.926	.050	.032	-.037
19	Implementation of the decision was unsuccessful.	-.119	.150	-.066	-.020	-.827
20	The decision was widely supported.	.638	.532	.055	.194	.081
21	The decision was widely acceptable.	.659	.082	.627	-.001	-.105
2	The decision was widely approved.	.361	.003	.803	.212	.008
23	The decision was successfully implemented.	.531	.403	-.268	.349	-.287
24	The implications of the decision were acceptable to everyone affected by the decision.	.252	.846	-.139	-.039	-.045

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 19 iterations.

TABLE I.2.C2: RELIABILITY ANALYSIS FOR DECISION QUALITY– SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corecte Item-Total Correlat	Squared Multiple Correlat ion	Alpha if Item Deleted
1	The decision achieved the intended results.	66.393	184.433	.809	.878	.949
2	The decision was sound.	66.242	178.501	.814	.699	.949
3	The decision added significant value to the organization.	65.787	178.422	.916	.914	.946
4	This was a high quality decision.	65.606	185.496	.810	.854	.949
5	The decision was appropriate given the organization's situation.	66.272	184.017	.827	.763	.949
6	The decision was current and topical.	65.303	190.655	.696	.800	.952
7	The decision was made and implemented in a timely manner.	65.636	178.426	.836	.907	.949
10	The decision was consistent with the overall strategy.	66.121	183.359	.841	.839	.949
11	The decision appropriately addressed the problems facing the organization	65.666	191.104	.748	.894	.951
12	The decision was well aligned with the objectives of the organization	66.181	178.215	.890	.875	.947
20	The decision was widely supported.	66.030	190.530	.667	.675	.953
21	The decision was widely acceptable.	65.818	188.778	.653	.523	.953
23	The decision was successfully implemented.	66.030	191.155	.514	.689	.958

Reliability Coefficients 13 items
Alpha = .954
Standardized item alpha = .955

➢ Decision Creativity

TABLE I.2.C3: FACTOR ANALYSIS FOR DECISION CREATIVITY
Rotated Component Matrix

	Items	1	2	3
1	The decision included new aspects compared to previous decisions in the organization.	.556	.515	.338
2	The decision was very different from others developed in the past in the organization.	.887	.051	.041
3	The decision broke some of the "rules of the game" within the market.	.653	.518	.209
4	The decision broke some of the "rules of the game" within the company	.662	.003	.467
5	This decision was innovative.	.509	.303	.486
6	Compared to previous, similar decisions, at least some parts were daring, risky, or bold.	.035	.095	.900
7	The decision was very novel for the organization.	.804	.142	.330
8	The decision offered new ideas to the organization.	.297	.068	.800
9	The decision was creative.	.658	.446	.105
10	The decision was uninteresting.	.067	.787	-.021
11	The decision spawned ideas for other/new strategies.	.125	.460	.621
12	The decision encouraged fresh thinking.	.153	.835	.180
13	The decision was inspiring.	.349	.610	.318
14	The decision involved lateral thinking.	.846	.285	.074

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 5 iterations.

TABLE I.2.C4: RELIABILITY ANALYSIS FOR DECISION CREATIVITY– SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correl	Squared Multiple Correlation	Alpha if Item Deleted
1	The decision included new aspects compared to previous decisions in the organization.	36.848	73.632	.656	.503	.883
2	The decision was very different from others developed in the past in the organization.	37.151	68.132	.688	.710	.879
3	The decision broke some of the "rules of the game" within the market.	37.727	69.579	.555	.574	.892
4	The decision broke some of the "rules of the game" within the company	37.484	63.570	.692	.632	.880
5	This decision was innovative.	37.515	69.195	.640	.693	.883
7	The decision was very novel for the organization.	37.454	65.380	.788	.692	.868
9	The decision was creative.	36.969	74.905	.664	.701	.884
14	The decision involved lateral thinking.	37.303	65.842	.789	.775	.868

Reliability Coefficients 8 items
Alpha = .893
Standardized item alpha = .899

APPENDIX II

PILOT TEST

APPENDIX II

PILOT TEST

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❖ ***Appendix II.1 Pre-test Questionnaire***

MARKET INFORMATION & DECISION MAKING

Thank you for taking the time to complete this questionnaire. Your responses are confidential and will be used in a research study concerning market information and decision making. For each of the statements listed below, please indicate the extent to which you agree or disagree by circling the appropriate number on the scale, where 1 indicates strong disagreement and 7 strong agreement. The questionnaire should take you about 30 minutes to complete.

SECTION I: DECISION MAKING

1.For every question we need you to refer to a specific strategic decision that you participated in. Please briefly describe below the most recent strategic marketing decision that was made and implemented in your company, and for which performance indications are available:

.....

.....

.....

2. Prior to initiating the decision making process and before acquiring any new information for this decision, compared to other firms in your industry, please indicate the extent to which in your organization:	**Not at All**						**To a Great Extent**
1. There already existed a great deal of experience concerning similar decisions.	1	2	3	4	5	6	7
2. There already existed a great deal of familiarity with this kind of decision.	1	2	3	4	5	6	7
3. There already existed a great deal of expertise in dealing with such projects.	1	2	3	4	5	6	7
4. There already existed a great deal of stored knowledge and know-how pertaining to this decision.	1	2	3	4	5	6	7
5. There already existed a significant amount of information about the issues surrounding the decision.	1	2	3	4	5	6	7
6. There already existed a great deal of skill in making and carrying out similar decisions.	1	2	3	4	5	6	7

3. Thinking about the overall complexity level of this decision making process please indicate the extent to which each statement describes the situation.	**Not at All**						**To a Great Extent**
1. The way to carry out the major activities involved in this decision was clear.	1	2	3	4	5	6	7
2. We were fairly certain of what the outcomes of the decision would be.	1	2	3	4	5	6	7
3. Difficult problems would arise during this decision, for which there were no apparent or immediate solutions.	1	2	3	4	5	6	7
4. For this decision we relied on established procedures and practices.	1	2	3	4	5	6	7
5. We had to spend a lot of time solving problems encountered during this decision.	1	2	3	4	5	6	7
6. The problems or issues we encountered in this decision were similar to those encountered in previous decisions.	1	2	3	4	5	6	7
7. The process of making and implementing this decision could be described as routine.	1	2	3	4	5	6	7
8. It took a lot of training and experience to deal with the problems encountered in this decision.	1	2	3	4	5	6	7
9. The problems encountered in this decision required extensive and demanding solutions.	1	2	3	4	5	6	7
10. The same work methods or steps were followed to resolve issues or problems in this decision as in previous decisions.	1	2	3	4	5	6	7
11. Overall this was a highly complex decision.	1	2	3	4	5	6	7

4. How would you rate the performance level of this decision?	**Very Low**						**Very High**
1. Overall decision performance compared to expectations.	1	2	3	4	5	6	7
2. Overall decision success.	1	2	3	4	5	6	7
3. Positive effect on organizational performance.	1	2	3	4	5	6	7
4. Net profits relative to expectations	1	2	3	4	5	6	7
5. Sales relative to expectations	1	2	3	4	5	6	7

5. With reference to the overall quality of this decision, please indicate the extent to which you agree or disagree with the following statements:	**Not at All**						**To a Great Extent**
1. The decision fully achieved the intended results.	1	2	3	4	5	6	7
2. The decision was based on valid assumptions.	1	2	3	4	5	6	7
3. The decision made sense in light of the organization's market position.	1	2	3	4	5	6	7
4. The decision was current and topical.	1	2	3	4	5	6	7
5. The decision was made and implemented in a timely manner.	1	2	3	4	5	6	7
6. The decision significantly contributed to the effectiveness of the organizaton.	1	2	3	4	5	6	7
7. The decision was consistent with the overall strategy.	1	2	3	4	5	6	7
8. The decision effectively addressed the problems that the organization was facing.	1	2	3	4	5	6	7
9. The decision was consistent with the objectives of the organization.	1	2	3	4	5	6	7
10. The implications of the decision were acceptable to everyone affected by the decision.	1	2	3	4	5	6	7
11. The decision was widely supported in the organization.	1	2	3	4	5	6	7
12. This was a high quality decision.	1	2	3	4	5	6	7

6. In evaluating the creativity of this decision, please indicate the extent to which you agree or disagree with the following statements:	**Strongly Disagree**						**Strongly Agree**
1. The decision included new aspects compared to previous decisions in the organization.	1	2	3	4	5	6	7
2. The decision was very different from others developed in the past in the organization.	1	2	3	4	5	6	7
3. The decision broke some of the "rules of the game" within the market.	1	2	3	4	5	6	7
4. The decision broke some of the "rules of the game" within the company	1	2	3	4	5	6	7
5. The decision was innovative.	1	2	3	4	5	6	7
6. The decision was very novel for the organization.	1	2	3	4	5	6	7
7. The decision was creative.	1	2	3	4	5	6	7
8. The decision involved lateral thinking.	1	2	3	4	5	6	7

SECTION II: ORGANIZATIONAL ENVIRONMENT

1. Thinking about the overall hierarchy in your organization's decision-making processes, to what extent...	**Not at All**						**To a Great Extent**
1. Can the process of making strategic decisions be characterized as participative?	1	2	3	4	5	6	7
2. Do one or two people dominate the handling of strategic issues with the organization?	1	2	3	4	5	6	7
3. Are views other than those of the top management included in the strategic decision processes?	1	2	3	4	5	6	7
4. Is there a free and open exchange of ideas among those participating in a given decision?	1	2	3	4	5	6	7
5. Do people affected by a decision typically feel that the definition of the issue(s) and/or the manner in which it was resolved was imposed upon them?	1	2	3	4	5	6	7
6. Does strategic decision-making tend to be made only at senior management levels?	1	2	3	4	5	6	7
7. Are people allowed to make decisions in matters concerning their work?	1	2	3	4	5	6	7
8. Do top managers make decisions without consulting with anyone else?	1	2	3	4	5	6	7
9. Is authority highly centralized?	1	2	3	4	5	6	7

2. Thinking about the formality of decision making in your organization, to what extent...	**Not at All**						**To a Great Extent**
1. Are written rules and procedures followed when decisions are addressed?	1	2	3	4	5	6	7
2. Do people make their own rules on the job?	1	2	3	4	5	6	7
3. Can decision-making be characterized as a process dominated by formal rules and procedures?	1	2	3	4	5	6	7
4. Is there a standard operating procedure for major decisions?	1	2	3	4	5	6	7
5. Must plans be rigidly followed throughout the decision-making process?	1	2	3	4	5	6	7
6. Is the way to carry out activities left up to the person doing the work?	1	2	3	4	5	6	7

3. Thinking about the overall culture and climate in your organization, please indicate the extent to which you agree or disagree with the following statements:	**Strongly Disagree**						**Strongly Agree**
1. Our organization is dynamic and entrepreneurial.	1	2	3	4	5	6	7
2. There is strong emphasis on innovation and change.	1	2	3	4	5	6	7
3. The management of this organization actively seeks innovative ideas.	1	2	3	4	5	6	7
4. People in this organization feel that others listen to their ideas.	1	2	3	4	5	6	7
5. There is commitment to continuous innovation and improvement.	1	2	3	4	5	6	7
6. Management is always willing to consider and adopt new ideas.	1	2	3	4	5	6	7
7. There is an eagerness to take risks.	1	2	3	4	5	6	7
8. In this organization learning is seen as a key to improvement.	1	2	3	4	5	6	7
9. Learning and innovation in the organization are seen as key to sustaining competitive advantage.	1	2	3	4	5	6	7
10. There is a general feeling of trust and confidence between different groups.	1	2	3	4	5	6	7
11. Employees view themselves as partners in charting the direction of the organization.	1	2	3	4	5	6	7
12. There is a commonality of purpose in this organization.	1	2	3	4	5	6	7

4. With reference to the nature of interaction among the members of the decision-making group, to what extent...	**Not at All**						**To a Great Extent**
1. Did the key people involved in this decision interact on an ongoing basis during the decision-making process?	1	2	3	4	5	6	7
2. Did individuals in the decision-making group interact with each other on an informal basis?	1	2	3	4	5	6	7
3. Were task groups formed to deal with strategic issues arising during this decision?	1	2	3	4	5	6	7
4. Can the process of making this decision be characterized as interactive?	1	2	3	4	5	6	7
5. Was there a free and open exchange of ideas among decision-makers about strategic issues?	1	2	3	4	5	6	7
6. Were there extensive formal and informal communications during decision-making?	1	2	3	4	5	6	7
7. Were the decision's objectives and goals communicated clearly to all the involved and concerned parties?	1	2	3	4	5	6	7

5. Regarding the level of co-operation between the different departments for this decision, to what extent...	**Not at All**						**To a Great Extent**
1. Did your department achieve goals collectively with other departments?	1	2	3	4	5	6	7
2. Did members of your department informally work together with people from other departments?	1	2	3	4	5	6	7
3. Did your department share ideas, information, and/or resources with other departments?	1	2	3	4	5	6	7
4. Did people from different departments work together as a team?	1	2	3	4	5	6	7
5. Did you experience problems coordinating work activities between the different departments?	1	2	3	4	5	6	7
6. Was there agreement on the priorities of each department?	1	2	3	4	5	6	7
7. Did your department compete for the same resources with other departments?	1	2	3	4	5	6	7
8. Were there senior managers from different departments "at odds" over elements of this decision?	1	2	3	4	5	6	7

6. Political activity is present in one form or another in most organizations. With reference to the decision making process you mentioned in section one, to what extent ...	**Not at All**						**To a Great Extent**
1. Were people open with each other about their own interests and preferences in the decision?	1	2	3	4	5	6	7
2. Were decision-makers primarily concerned with their own goals rather than with the goals of the organization?	1	2	3	4	5	6	7
3. Was the decision affected by the use of power and influence among decision-makers?	1	2	3	4	5	6	7
4. Was the decision affected by bargaining among decision-makers?	1	2	3	4	5	6	7
5. Can decision-making be characterized as the "give and take" of different interests and factions?	1	2	3	4	5	6	7
6. Did decision-makers join forces or form alliances with other people or departments to "push through" their points of view?	1	2	3	4	5	6	7

SECTION III: ACQUISITION OF MARKET INFORMATION IN DECISION MAKING

3. The process of making strategic decisions typically involves the collection of relevant market information. Thinking about the amount of market information that was acquired for the decision you described in Section I, to what extent do you agree or disagree with the following statements?	**Strongly Disagree**						**Strongly Agree**
1. We made a significant investment in market research and the collection of new information.	1	2	3	4	5	6	7
2. We acquired sufficient information to address issues arising during this decision.	1	2	3	4	5	6	7
3. We collected all possible information before making the decision.	1	2	3	4	5	6	7
4. We needed more information to deal with the issues arising during the decision.	1	2	3	4	5	6	7
5. Intelligence collected on our competitors was comprehensive.	1	2	3	4	5	6	7
6. We collected extensive information on our customers' needs.	1	2	3	4	5	6	7
7. We systematically reviewed the conditions in our business environment that may have impacted this decision (e.g. competition, technology, regulation).	1	2	3	4	5	6	7
8. We collected industry information to detect any fundamental shifts.	1	2	3	4	5	6	7
9. We collected information from people who can influence our end users' purchase behaviour (e.g. retailers, distributors).	1	2	3	4	5	6	7

SECTION IV: EVALUATING & INTERPRETING INFORMATION FOR DECISION MAKING

1. Thinking about the content of the market information collected for the decision, please indicate the degree to which you agree or disagree with the following statements:	**Strongly Disagree**						**Strongly Agree**
1. The information was meaningful.	1	2	3	4	5	6	7
2. The information was clear and understandable.	1	2	3	4	5	6	7
3. The information made sense.	1	2	3	4	5	6	7
4. The information was logical and coherent.	1	2	3	4	5	6	7
5. The information conveyed conflicting signals.	1	2	3	4	5	6	7
6. The information conveyed contradictory statements and findings.	1	2	3	4	5	6	7
7. The information was ambiguous.	1	2	3	4	5	6	7

2. In evaluating the innovativeness of the market information, to what extent do you agree or disagree with the following?	**Strongly Disagree**						**Strongly Agree**
1. The information raised new issues/perspectives.	1	2	3	4	5	6	7
2. The information provided innovative insights into the issues at hand.	1	2	3	4	5	6	7
3. The information challenged existing assumptions.	1	2	3	4	5	6	7
4. The information provided non-obvious insights into the issues at hand.	1	2	3	4	5	6	7
5. The information contained elements of surprise.	1	2	3	4	5	6	7

3. Concerning the overall quality of the market information collected for this decision, to what extent do you agree or disagree with the following statements?	**Strongly Disagree**						**Strongly Agree**
1. The information was accurate.	1	2	3	4	5	6	7
2. The information was specific and to the point.	1	2	3	4	5	6	7
3. The information was realistic.	1	2	3	4	5	6	7
4. The information was available on time.	1	2	3	4	5	6	7
5. The information was current and topical.	1	2	3	4	5	6	7
6. The information was out of date.	1	2	3	4	5	6	7
7. The information was based on valid assumptions.	1	2	3	4	5	6	7
8. The technical quality of the information was high.	1	2	3	4	5	6	7
9. The information accurately reflected market conditions.	1	2	3	4	5	6	7
10. The information was internally consistent and valid.	1	2	3	4	5	6	7
11. I was unsure whether to trust the information.	1	2	3	4	5	6	7
12. I felt I could rely on the information.	1	2	3	4	5	6	7
13. The information was questionable.	1	2	3	4	5	6	7

4. In evaluating the overall relevance and usefulness of the market information in making and implementing this decision, to what extent would you agree or disagree with the following statements?	**Strongly Disagree**						**Strongly Agree**
1. The information was suitable to address the issues relating to the decision.	1	2	3	4	5	6	7
2. The information was relevant to the decision.	1	2	3	4	5	6	7
3. The information was rather inappropriate for the decision.	1	2	3	4	5	6	7
4. The information matched very well our intelligence needs for this decision.	1	2	3	4	5	6	7
5. The information adequately addressed the problems we had to solve.	1	2	3	4	5	6	7
6. The information had clear action implications.	1	2	3	4	5	6	7
7. The information provided explicit recommendations pertaining to the decision.	1	2	3	4	5	6	7
8. The information suggested recommendations that could be easily put into effect.	1	2	3	4	5	6	7
9. The information suggested feasible implications in terms of costs.	1	2	3	4	5	6	7
10. The information suggested feasible implications in terms of time.	1	2	3	4	5	6	7

5. During the process of analyzing information about the market, decision-makers are likely to interpret the information in different ways, bringing their own different perspectives to the situation. In the process of making the decision you described in Section I, to what extent...	**Not at All**						**To a Great Extent**
1. Did decision-makers challenge each other's opinions of what the information meant?	1	2	3	4	5	6	7
2. Were different opinions about the implications of the information expressed among decision-makers?	1	2	3	4	5	6	7
3. Did the collected information sometimes mean different things to different people?	1	2	3	4	5	6	7
4. Were there disagreements over different ideas about the content of the information?	1	2	3	4	5	6	7
5. Was the information analyzed from many different perspectives?	1	2	3	4	5	6	7
6. Were there differences in the interpretation of the market information among decision-makers?	1	2	3	4	5	6	7
7. Did decision-makers voice dissent while analyzing the information?	1	2	3	4	5	6	7
8. Were different solutions produced as a result of the different understanding of the information among decision-makers?	1	2	3	4	5	6	7
9. Was information interpreted in different ways by the decision-makers?	1	2	3	4	5	6	7

6. Because during decision-making different people bring their own different perspectives to the situation, collective interpretation of market information by a group of decision-makers can sometimes result in changes on the individual's way of thinking about the decision. Thinking about the way in which the group process of analyzing and interpreting the collected information influenced this decision, please indicate the extent to which each statement describes the situation.	**Not at All**						**To a Great Extent**
1. The group information analysis process revealed opportunities/problems that were not considered before.	1	2	3	4	5	6	7
2. The group information analysis process motivated me to re-examine my own personal assumptions about the situation.	1	2	3	4	5	6	7
3. The group information analysis process provided novel insight in setting specific goals and objectives for this decision.	1	2	3	4	5	6	7
4. The group information analysis process helped produce a wider range of alternatives for this decision.	1	2	3	4	5	6	7
5. The group information analysis process uncovered ideas about this decision that I did not consider before.	1	2	3	4	5	6	7
6. The group information analysis process prompted me to critically re-evaluate my own recommendations for this decision.	1	2	3	4	5	6	7
7. The group information analysis process provided distinct directions in selecting amongst alternative options.	1	2	3	4	5	6	7
8. The group information analysis process resulted in selecting a course of action that originated from synergy rather than my own individual analysis.	1	2	3	4	5	6	7

SECTION VI: INDUSTRY CONDITIONS

In assessing the conditions in the industry your organization is competing, please indicate the extent to which you agree or disagree with the following statements:	**Strongly Disagree**						**Strongly Agree**
1. In our kind of business, customers' product preferences change repeatedly over time.	1	2	3	4	5	6	7
2. Our customers tend to look for new products all the time.	1	2	3	4	5	6	7
3. We are witnessing demand for our products and services from customers who never bought them before.	1	2	3	4	5	6	7
4. New customers tend to have product-related needs that are different from those of our existing customers.	1	2	3	4	5	6	7
5. We cater to many of the same customers that we used to in the past.	1	2	3	4	5	6	7
6. Competition in our industry is cutthroat.	1	2	3	4	5	6	7
7. There are many "promotion wars" in our industry.	1	2	3	4	5	6	7
8. Anything that one competitor can offer, others can match readily.	1	2	3	4	5	6	7
9. Price competition is a hallmark of our industry.	1	2	3	4	5	6	7
10. One hears of a new competitor almost every day.	1	2	3	4	5	6	7
11. Our competitors are relatively weak.	1	2	3	4	5	6	7
12. The technology in our industry is changing rapidly.	1	2	3	4	5	6	7
13. Technological changes provide big opportunities in our industry.	1	2	3	4	5	6	7
14. It is very difficult to forecast where the technology in our industry will be in the next 2 to 3 years.	1	2	3	4	5	6	7
15. A large number of new product ideas have been made possible through technological breakthroughs in our industry.	1	2	3	4	5	6	7
16. Technological developments in our industry are rather narrow.	1	2	3	4	5	6	7

SECTION VII: ADDITIONAL INFORMATION

The following information is only for classification purposes.

Age of organization: _____

Industry of organization: _____

Your position in the organization: _____

No of years in the organization _____

THANK YOU VERY MUCH FOR YOUR PARTICIPATION! ☺

❖ ***Appendix II.2 Pilot Test Factor & Reliability Analysis***

II.2.A Organizational Context Variables

➢ Centralization

TABLE II.2.A1: FACTOR ANALYSIS FOR CENTRALIZATION
Rotated Component Matrix

	Items	1	2	3
1	Can the process of making strategic decisions be characterized as participative? (R)	.459	.710	-.341
2	Do one or two people dominate the handling of strategic issues with the organization?	-.013	.415	.708
3	Are views other than those of the top management included in the strategic decision processes?(R)	.873	.183	.101
4	Is there a free and open exchange of ideas among those participating in a given decision?(R)	.429	.571	.394
5	Do people affected by a decision typically feel that the definition of the issue(s) and/or the manner in which it was resolved was imposed upon them?	.092	.814	.115
6	Does strategic decision-making tend to be made only at senior management levels?	.526	.146	.573
7	Are people allowed to make decisions in matters concerning their work? (R)	.847	.200	.157
8	Do top managers make decisions without consulting with anyone else?	.213	.673	.430
9	Is authority highly centralized?	.178	-.051	.852

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 6 iterations.

Table II.2.A2: Reliability Analysis For Centralization– Scale (Alpha)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	Can the process of making strategic decisions be characterized as participative? (R)	18.742	27.373	.536	.404	.760
3	Are views other than those of the top management included in the strategic decision processes? (R)	18.828	26.087	.632	.510	.739
5	Do people affected by a decision typically feel that the definition of the issue(s) and/or the manner in which it was resolved was imposed upon them?	17.800	28.047	.479	.354	.771
6	Does strategic decision-making tend to be made only at senior management levels?	16.971	24.910	.492	.330	.772
7	Are people allowed to make decisions in matters concerning their work? (R)	17.971	24.499	.644	.530	.731
8	Do top managers make decisions without consulting with anyone else?	18.114	23.810	.519	.314	.768

Reliability Coefficients 6 items
Alpha = .789
Standardized item alpha = .798

➢ Formalization

TABLE II.2.A3: FACTOR ANALYSIS FOR FORMALIZATION
Rotated Component Matrix

	Items	1	2
1	Are written rules and procedures followed when decisions are addressed?	.787	-.288
2	Do people make their own rules on the job? (R)	535	-.097
3	Can decision-making be characterized as a process dominated by formal rules and procedures?	.829	.056
4	Is there a standard operating procedure for major decisions?	.746	.250
5	Must plans be rigidly followed throughout the decision-making process?	.717	.482
6	Is the way to carry out activities left up to the person doing the work? (R)	-.053	.886

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE II.2.A4: RELIABILITY ANALYSIS FOR FORMALIZATION – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlat	Squared Multiple Correlatio	Alpha if Item Deleted
1	Are written rules and procedures followed when decisions are addressed?	18.323	20.346	.514	.462	.673
2	Do people make their own rules on the job? (R)	18.500	22.197	.368	.262	.719
3	Can decision-making be characterized as a process dominated by formal rules and procedures?	18.617	20.910	.625	.563	.646
4	Is there a standard operating procedure for major decisions?	18.470	19.044	.593	.448	.646
5	Must plans be rigidly followed throughout the decision-making process?	18.558	19.708	.610	.557	.642
6	Is the way to carry out activities left up to the person doing the work? (R)	19.000	27.878	.061	.123	.775

Reliability Coefficients 6 items
Alpha = .728
Standardized item alpha = .711

➢ Innovative Culture

TABLE II.2.A4: FACTOR ANALYSIS FOR INNOVATIVE CULTURE
Rotated Component Matrix

	Items	1	2
1	Our organization is dynamic and entrepreneurial.	.401	.806
2	There is strong emphasis on innovation and change.	.370	.842
3	The management of this organization actively seeks innovative ideas.	.474	.688
4	People in this organization feel that others listen to their ideas.	.773	.290
5	There is commitment to continuous innovation and improvement.	.559	.530
6	Management is always willing to consider and adopt new ideas.	.642	.425
7	There is an eagerness to take risks.	.052	.753
8	In this organization learning is seen as a key to improvement.	.783	.272
9	Learning and innovation in the organization are seen as key to sustaining competitive advantage.	.810	.379
10	There is a general feeling of trust and confidence between different groups.	.802	.359
11	Employees view themselves as partners in charting the direction of the organization.	.877	.112
12	There is a commonality of purpose in this organization.	.736	.241

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE II.2.A5: RELIABILITY ANALYSIS FOR INNOVATIVE CULTURE– SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	Our organization is dynamic and entrepreneurial.	24.342	23.937	.797	.834	.835
2	There is strong emphasis on innovation and change.	24.542	24.667	.831	.841	.830
3	The management of this organization actively seeks innovative ideas.	24.314	25.868	.755	.648	.844
5	There is commitment to continuous innovation and improvement.	24.485	27.021	.681	.502	.856
6	Management is always willing to consider and adopt new ideas.	24.228	27.828	.558	.519	.875
7	There is an eagerness to take risks.	25.228	26.946	.512	.339	.880

Reliability Coefficients 6 items
Alpha = .877
Standardized item alpha = .880

➢ Interdepartmental Integration: Interaction

TABLE II.2.A6: FACTOR ANALYSIS FOR INTERACTION
Rotated Component Matrix

	Items	1	2
1	Did the key people involved in this decision interact on an ongoing basis during the decision-making process?	.466	.702
2	Did individuals in the decision-making group interact with each other on an informal basis?	.557	.341
3	Were task groups formed to deal with strategic issues arising during this decision?	-.073	.855
4	Can the process of making this decision be characterized as interactive?	.643	.606
5	Was there a free and open exchange of ideas among decision-makers about strategic issues?	.913	.105
6	Were there extensive formal and informal communications during decision-making?	.839	.447
7	Were the decision's objectives and goals communicated clearly to all the involved and concerned parties?	.805	-.040

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE II. 2.A7: RELIABILITY ANALYSIS FOR INTERACTION – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	Did the key people involved in this decision interact on an ongoing basis during the decision-making process?	29.857	36.126	.675	.557	.799
2	Did individuals in the decision-making group interact with each other on an informal basis?	29.542	38.373	.502	.426	.822
3	Were task groups formed to deal with strategic issues arising during this decision?	30.914	35.551	.299	.235	.882
4	Can the process of making this decision be characterized as interactive?	30.028	32.499	.789	.733	.776
5	Was there a free and open exchange of ideas among decision-makers about strategic issues?	29.771	34.063	.677	.738	.794
6	Were there extensive formal and informal communications during decision-making?	29.742	32.431	.867	.861	.766
7	Were the decision's objectives and goals communicated clearly to all the involved and concerned parties?	29.457	36.843	.511	.479	.820

Reliability Coefficients 7 items
Alpha = .833
Standardized item alpha = .858

➢ Interdepartmental Integration: Collaboration

TABLE II.2.A8: FACTOR ANALYSIS FOR COLLABORATION
Rotated Component Matrix

	Items	1	2
1	Did your department achieve goals collectively with other departments?	.665	-.254
2	Did members of your department informally work together with people from other departments?	.877	.185
3	Did your department share ideas, information, and/or resources with other departments?	.898	.093
4	Did people from different departments work together as a team?	.845	.094
5	Did you experience problems coordinating work activities between the different departments? (R)	.510	.544
6	Was there agreement on the priorities of each department?	.042	.639
7	Did your department compete for the same resources with other departments? (R)	-.019	.781
8	Were there senior managers from different departments "at odds" over elements of this decision? (R)	.020	.768

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a Rotation converged in 3 iterations.

TABLE II.2.A9: RELIABILITY ANALYSIS FOR COOPERATION – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Corelation	Squared Multiple Corelation	Alpha if Item Deleted
1	Did your department achieve goals collectively with other departments?	20.727	19.579	.433	.245	.845
2	Did members of your department informally work together with people from other departments?	20.272	17.017	.805	.723	.745
3	Did your department share ideas, information, and/or resources with other departments?	20.242	16.626	.784	.722	.747
4	Did people from different departments work together as a team?	20.424	16.189	.711	.567	.766
5	Did you experience problems coordinating work activities between the different departments? (R)	20.878	19.422	.440	.355	.844

Reliability Coefficients 5 items
Alpha = .8276
Standardized item alpha = .832

➢ Political Behavior

TABLE II.2.A10: FACTOR ANALYSIS FOR POLITICAL BEHAVIOR
Rotated Component Matrix

	Items	1	2
1	Were people open with each other about their own interests and preferences in the decision? {R}	.136	.847
2	Were decision-makers primarily concerned with their own goals rather than with the goals of the organization?	.785	.227
3	Was the decision affected by the use of power and influence among decision-makers?	.064	.738
4	Was the decision affected by bargaining among decision-makers?	.719	.354
5	Can decision-making be characterized as the "give and take" of different interests and factions?	.859	-.153
6	Did decision-makers join forces or form alliances with other people or departments to "push through" their points of view?	.527	.489

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE II.2.A11: RELIABILITY ANALYSIS FOR POLITICAL BEHAVIOR – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	Were people open with each other about their own interests and preferences in the decision? {R}	18.800	30.105	.418	.368	.726
2	Were decision-makers primarily concerned with their own goals rather than with the goals of the organization?	18.685	25.927	.602	.411	.675
3	Was the decision affected by the use of power and influence among decision-makers?	17.800	30.752	.318	.164	.749
4	Was the decision affected by bargaining among decision-makers?	18.514	25.080	.627	.428	.666
5	Can decision-making be characterized as the "give and take" of different interests and factions?	17.914	26.551	.417	.373	.733
6	Did decision-makers join forces or form alliances with other people or departments to "push through" their points of view?	18.428	25.781	.537	.323	.693

Reliability Coefficients 6 items
Alpha = .746
Standardized item alpha = .746

➢ Organizational Memory

TABLE II.2.A12: FACTOR ANALYSIS FOR ORGANIZATIONAL MEMORY
Rotated Component Matrix

	Items	1	2
1	There already existed a great deal of experience concerning similar decisions.	.943	.144
2	There already existed a great deal of familiarity with this kind of decision.	.966	.133
3	There already existed a great deal of expertise in dealing with such projects.	.917	.099
4	There already existed a great deal of stored knowledge and know-how pertaining to this decision.	.718	.585
5	There already existed a significant amount of information about the issues surrounding the decision.	.095	.976
6	There already existed a great deal of skill in making and carrying out similar decisions.	.744	.364

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE II.2.A13: RELIABILITY ANALYSIS FOR ORGANIZATIONAL MEMORY – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	There already existed a great deal of experience concerning similar decisions.	22.485	37.198	.869	.910	.879
2	There already existed a great deal of familiarity with this kind of decision.	22.514	38.257	.897	.933	.874
3	There already existed a great deal of expertise in dealing with such projects.	22.400	42.423	.813	.753	.889
4	There already existed a great deal of stored knowledge and know-how pertaining to this decision.	22.457	41.549	.838	.763	.885
5	There already existed a significant amount of information about the issues surrounding the decision.	22.542	52.490	.366	.482	.939
6	There already existed a great deal of skill in making and carrying out similar decisions.	22.314	42.692	.747	.601	.897

Reliability Coefficients 6 items
Alpha = .913
Standardized item alpha = .906

II.2.B Learning Process Variables

➢ Scanning

TABLE II.2.B1: FACTOR ANALYSIS FOR SCANNING
Rotated Component Matrix

	Items	1	2
1	We made a significant investment in market research and the collection of new information.	.787	.133
2	We acquired sufficient information to address the issues arising during this decision.	.180	.823
3	We collected all possible information before making the decision.	.464	.776
4	We needed more information to deal with the issues arising during the decision. (R)	-.303	.816
5	Intelligence collected on our competitors was comprehensive.	.799	.167
6	We collected extensive information on our customers' needs.	.771	-.131
7	We systematically reviewed the conditions in our business environment that may have impacted this decision (e.g. competition, technology, regulation).	.826	.272
8	We collected industry information to detect any fundamental shifts.	.680	.312
9	We collected information from people who can influence our end users' purchase behaviour (e.g. retailers, distributors).	.851	-.174

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE II.2.B2: RELIABILITY ANALYSIS FOR SCANNING – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Corelation	Squared Multiple Corelation	Alpha if Item Deleted
1	We made a significant investment in market research and the collection of new information.	36.100	67.817	.638	.613	.802
2	We acquired sufficient information to address the issues arising during this decision.	34.766	76.598	.449	.547	.823
3	We collected all possible information before making the decision.	35.400	67.834	.679	.734	.797
4	We needed more information to deal with the issues arising during the decision. (R)	35.666	86.505	.010	.500	.870
5	Intelligence collected on our competitors was comprehensive.	35.533	71.774	.683	.636	.801
6	We collected extensive information on our customers' needs.	35.233	73.702	.507	.495	.818
7	We systematically reviewed the conditions in our business environment that may have impacted this decision	34.800	66.234	.787	.736	.785
8	We collected industry information to detect any fundamental shifts.	35.100	69.196	.632	.660	.803
9	We collected information from people who can influence our end users' purchase behavior.	35.266	70.754	.549	.665	.813

Reliability Coefficients 9 items
Alpha = .832
Standardized item alpha = .834

➢ Interpretive Diversity - Content

TABLE II.2.B3: FACTOR ANALYSIS FOR INTERPRETIVE DIVERSITY OF CONTENT

Component Matrix

	Items	1
1	Did decision-makers challenge each other's opinions of what the information meant?	.875
2	Were different opinions about the implications of the information expressed among decision-makers?	.810
3	Did the collected information sometimes mean different things to different people?	.895
4	Were there disagreements over different ideas about the content of the information?	.854
5	Was the information analyzed from many different perspectives?	.544
6	Were there differences in the interpretation of the market information among decision-makers?	.888
7	Did decision-makers voice dissent while analyzing the information?	.775
8	Were different solutions produced as a result of the different understanding of the information among decision-makers?	.683
9	Was information interpreted in different ways by the decision-makers?	.846

Extraction Method: Principal Component Analysis.
1 component extracted.

TABLE II.2.B4: RELIABILITY ANALYSIS FOR INTERPRETIVE DIVERSITY OF CONTENT – SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Corelation	Squared Multiple Corelation	Alpha if Item Deleted
1	Did decision-makers challenge each other's opinions of what the information meant?	31.363	99.801	.829	.755	.914
2	Were different opinions about the implications of the information expressed among decision-makers?	31.333	105.291	.741	.689	.920
3	Did the collected information sometimes mean different things to different people?	31.606	97.933	.860	.785	.912
4	Were there disagreements over different ideas about the content of the information?	31.848	102.004	.799	.757	.916
5	Was the information analyzed from many different perspectives?	31.303	112.403	.472	.367	.935
6	Were there differences in the interpretation of the market information among decision-makers?	31.818	102.020	.842	.782	.914
7	Did decision-makers voice dissent while analyzing the information?	32.151	104.001	.705	.588	.922
8	Were different solutions produced as a result of the different understanding of the information among decision-makers?	32.393	106.995	.609	.621	.928
9	Was information interpreted in different ways by the decision-makers?	32.000	101.871	.798	.788	.916

Reliability Coefficients 9 items
Alpha = .929
Standardized item alpha = .929

➢ Interpretive Frame

TABLE II.2.B5: FACTOR ANALYSIS FOR INTERPRETIVE FRAME – QUALITY DIMENSIONS
Rotated Component Matrix

	Items	1	2	3
1	The information was accurate.	.907	.015	.024
2	The information was specific and to the point.	.879	.178	.003
3	The information was realistic.	.813	.268	.117
4	The information was available on time.	.136	.770	.217
5	The information was current and topical.	-.001	.043	.893
6	The information was out of date. (R)	.076	.878	-.224
7	The information was based on valid assumptions.	.575	.230	.567
8	The technical quality of the information was high.	.691	.311	.210
9	The information accurately reflected market conditions.	.626	.388	.183
10	The information was internally consistent and valid.	.231	.562	.605
11	I was unsure whether to trust the information. (R)	.305	.797	.281
12	I felt I could rely on the information.	.460	.646	.448
13	The information was questionable. (R)	.422	.789	.246

Extraction Method: Principal Component Analysis.
Rotation Method:Varimax with Kaiser Normalization.
Rotation converged in 4 iterations.

TABLE II.2.B6: RELIABILITY ANALYSIS FOR INTERPRETIVE FRAME – QUALITY DIMENSIONS– SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	The information was accurate.	57.028	126.021	.559	.728	.921
2	The information was specific and to the point.	57.171	124.492	.653	.862	.918
3	The information was realistic.	56.885	123.750	.703	.856	.916
4	The information was available on time.	56.942	121.585	.614	.751	.919
6	The information was out of date. (R)	56.285	125.975	.500	.750	.924
7	The information was based on valid assumptions.	56.914	123.841	.654	.721	.918
8	The technical quality of the information was high.	57.400	116.8943	.682	.820	.917
9	The information accurately reflected market conditions.	56.971	124.733	.677	.728	.917
10	The information was internally consistent and valid.	56.942	126.583	.667	.691	.918
11	I was unsure whether to trust the information. (R)	57.028	112.442	.780	.876	.912
12	I felt I could rely on the information.	57.028	114.671	.844	.878	.909
13	The information was questionable (R)	56.971	111.028	.861	.915	.908

Reliability Coefficients 12 items
Alpha = .923
Standardized item alpha = .925

TABLE II.2.B7: FACTOR ANALYSIS FOR INTERPRETIVE FRAME – USEFULNESS DIMENSIONS
Rotated Component Matrix

	Items	1	2	3	4	5
1	The information was meaningful.	.111	-.073	.468	.700	-.295
2	The information was clear and understandable.	.426	.121	.831	.028	-.098
3	The information made sense.	.470	.119	.760	-.053	.101
4	The information was logical and coherent.	.318	-.019	.817	-.026	.232
5	The information raised new issues/perspectives.	.158	.846	.336	.062	.197
6	The information provided innovative insights into the issues at hand.	.181	.824	.308	.125	.145
7	The information challenged existing assumptions.	.280	.876	-.201	.052	.034
8	The information provided non-obvious insights into the issues at hand.	.027	.539	-.029	.631	-.090
9	The information contained elements of surprise.	.201	.650	-.332	.493	-.056
10	The information was suitable to address the issues relating to the decision.	.805	.183	.250	.249	-.022
11	The information was relevant to the decision.	.881	.088	.201	.191	.004
12	The information was rather inappropriate for the decision. (R)	.673	.030	.477	.167	-.039
13	The information matched very well our intelligence needs for this decision.	.816	.216	.225	.147	-.017
14	The information adequately addressed the problems we had to solve.	.892	.132	.238	.065	.137
15	The information had clear action implications.	.815	.220	.065	-.027	.019
16	The information provided explicit recommendations pertaining to the decision.	.302	.311	-.067	.723	.181
17	The information suggested recommendations that could be easily put into effect.	.177	.005	-.088	.758	.526
18	The information suggested feasible implications in terms of costs.	.064	.160	-.108	.072	.862
19	The information suggested feasible implications in terms of time.	-.069	.036	.362	-.002	.772

Extraction Method: Principal Component Analysis.
Rotation Method:Varimax with Kaiser Normalization.
Rotation converged in 11 iterations.

TABLE II.2.B8: RELIABILITY ANALYSIS FOR INTERPRETIVE FRAME – USEFULNESS DIMENSIONS– SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Coreltion	Squared Multiple Correlation	Alpha if Item Deleted
2	The information was clear and understandable.	60.428	151.663	.584	.841	.888
3	The information made sense.	60.257	153.137	.586	.906	.889
4	The information was logical and coherent.	60.285	156.151	.436	.868	.893
5	The information raised new issues/perspectives.	61.485	142.963	.638	.811	.885
6	The information provided innovative insights into the issues at hand.	61.628	142.769	.648	.792	.885
7	The information challenged existing assumptions.	61.457	144.196	.513	.838	.892
9	The information contained elements of surprise.	62.085	150.139	.409	.716	.896
10	The information was suitable to address the issues relating to the decision.	60.714	143.798	.760	.837	.881
11	The information was relevant to the decision.	60.485	146.316	.740	.906	.882
12	The information was rather inappropriate for the decision. (R)	60.142	147.596	.616	.875	.886
13	The information matched very well our intelligence needs for this decision.	61.028	139.852	.732	.862	.881
14	The information adequately addressed the problems we had to solve.	61.114	142.398	.751	.882	.881
16	The information provided explicit recommendations pertaining to the decision.	61.942	145.055	.547	.744	.890
17	The information suggested recommendations that could be easily put into effect.	61.971	154.087	.344	.708	.898

Reliability Coefficients 14 items
Alpha = .895
Standardized item alpha = .902

➢ Adaptation

TABLE II.2.B9: FACTOR ANALYSIS FOR ADAPTATION
Rotated Component Matrix

	Items	1	2
1	The group information analysis process revealed opportunities/problems that were not considered before.	.763	.328
2	The group information analysis process motivated me to re-examine my own personal assumptions about the situation.	.854	.010
3	The group information analysis process provided novel insight in setting specific goals and objectives for this decision.	.643	.501
4	The group information analysis process helped produce a wider range of alternatives for this decision.	.488	.596
5	The group information analysis process uncovered ideas about this decision that I did not consider before.	.812	.185
6	The group information analysis process prompted me to critically re-evaluate my own recommendations for this decision.	.800	.198
7	The group information analysis process provided distinct directions in selecting amongst alternative options.	.214	.876
8	The group information analysis process resulted in selecting a course of action that originated from synergy rather than my own individual analysis.	.043	.804

Extraction Method: Principal Component Analysis.
Rotation Method:Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE II.2.B10: RELIABILITY ANALYSIS FOR ADAPTATION– SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Varianc e if Item Deleted	Corrected Item-Total Coreltion	Square Multiple Correlati on	Alpha if Item Deleted
1	The group information analysis process revealed opportunities/problems that were not considered before.	30.371	41.299	.725	.686	.842
2	The group information analysis process motivated me to re-examine my own personal assumptions about the situation.	30.085	43.786	.598	.567	.857
3	The group information analysis process provided novel insight in setting specific goals and objectives for this decision.	30.371	43.652	.726	.769	.844
4	The group information analysis process helped produce a wider range of alternatives for this decision.	30.028	43.146	.624	.714	.854
5	The group information analysis process uncovered ideas about this decision that I did not consider before.	30.028	43.616	.679	.539	.848
6	The group information analysis process prompted me to critically re-evaluate my own recommendations for this decision.	30.342	43.173	.686	.636	.847
7	The group information analysis process provided distinct directions in selecting amongst alternative options.	30.342	46.231	.590	.618	.858
8	The group information analysis process resulted in selecting a course of action that originated from synergy rather than my own individual analysis.	30.228	48.240	.389	.482	.878

Reliability Coefficients 8 items
Alpha = .870
Standardized item alpha = .871

II.2.C Decision Effectiveness Variables

➢ Decision Quality

TABLE II.2.C1: FACTOR ANALYSIS FOR DECISION QUALITY
Rotated Component Matrix

	Items	1	2	3
1	The decision fully achieved the intended results.	.806	.049	.043
2	The decision was based on valid assumptions.	.820	.197	.120
3	The decision made sense in light of the organization's market position.	.460	.631	.250
4	The decision was current and topical.	.696	.126	-.027
5	The decision was made and implemented in a timely manner.	.704	.111	.070
6	The decision significantly contributed to the effectiveness of the organizaton.	.594	.515	-.332
7	The decision was consistent with the overall strategy.	.296	.667	.179
8	The decision effectively addressed the problems that the organization was facing.	.040	.845	-.256
9	The decision was consistent with the objectives of the organization.	.019	.892	.272
10	The implications of the decision were acceptable to everyone affected by the decision.	-.043	.048	[illegible]
11	The decision was widely supported in the organization.	.436	.161	.67[illegible]
12	This was a high quality decision.	.718	.157	.232

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 5 iterations.

TABLE II.2.C2: RELIABILITY ANALYSIS FOR DECISION QUALITY– SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	CorrecIt em-Total Correl	Squared Multiple Correlation	Alpha if Item Deleted
1	The decision fully achieved the intended results.	38.764	32.912	.669	.546	.833
2	The decision was based on valid assumptions.	38.411	32.976	.748	.623	.824
3	The decision made sense in light of the organization's market position.	38.147	36.432	.600	.379	.843
4	The decision was current and topical.	38.470	34.923	.577	.404	.844
5	The decision was made and implemented in a timely manner.	38.676	34.649	.594	.443	.842
6	The decision significantly contributed to the effectiveness of the organizaton.	38.823	34.695	.551	.374	.847
7	The decision was consistent with the strategy.	38.941	35.026	.473	.336	.858
8	The decision effectively addressed the problems that the organization was facing.	38.588	34.007	.646	.515	.836
9	The decision was consistent with the objectives of the organization.	38.764	32.912	.669	.546	.833
10	The implications of the decision were acceptable to everyone affected by the decision.	38.411	32.976	.748	.623	.824
11	The decision was widely supported	38.147	36.432	.600	.379	.843
12	This was a high quality decision.	38.470	34.923	.577	.404	.844

Reliability Coefficients 8 items
Alpha = .858
Standardized item alpha = .862

➢ Decision Creativity

TABLE II.2.C3: FACTOR ANALYSIS FOR DECISION CREATIVITY
Rotated Component Matrix

	Items	1	2
1	The decision included new aspects compared to previous decisions in the organization.	.057	.863
2	The decision was very different from others developed in the past in the organization.	.833	.035
3	The decision broke some of the "rules of the game" within the market.	.789	.192
4	The decision broke some of the "rules of the game" within the company	.870	.156
5	The decision was innovative.	.614	.636
6	The decision was very novel for the organization.	.580	.626
7	The decision was creative.	.513	.213
8	The decision involved lateral thinking.	.152	.864

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE II.2.C4: RELIABILITY ANALYSIS FOR DECISION CREATIVITY– SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	The decision included new aspects compared to previous decisions in the organization.	32.030	76.467	.428	.271	.860
2	The decision was very different from others developed in the past in the organization.	32.939	67.558	.581	.549	.848
3	The decision broke some of the "rules of the game" within the market.	33.454	63.193	.647	.649	.841
4	The decision broke some of the "rules of the game" within the company	33.393	61.933	.674	.769	.838
5	The decision was innovative.	32.848	62.695	.807	.709	.822
6	The decision was very novel for the organization.	33.151	64.070	.760	.724	.828
7	The decision was creative.	32.575	70.126	.537	.524	.853
8	The decision involved lateral thinking.	32.636	71.863	.455	.621	.861

Reliability Coefficients 8 items
Alpha = .862
Standardized item alpha = .861

➢ Decision Performance

TABLE II.2.C5: FACTOR ANALYSIS FOR DECISION PERFORMANCE
Component Matrix

	Items	1
1	Overall decision performance compared to expectations.	.794
2	Overall decision success.	.850
3	Positive effect on organizational performance.	.862
4	Net profits relative to expectations	.782
5	Sales relative to expectations	.885

Extraction Method: Principal Component Analysis.
1 component extracted.

TABLE II.2.C6: RELIABILITY ANALYSIS FOR DECISION PERFORMANCE – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Coreltion	Squared Multiple Correlatio n	Alpha if Item Deleted
1	Overall decision performance compared to expectations.	21.181	18.090	.665	.800	.877
2	Overall decision success.	21.151	16.382	.739	.803	.860
3	Positive effect on organizational performance.	21.151	17.507	.769	.631	.857
4	Net profits relative to expectations	21.636	16.113	.676	.814	.877
5	Sales relative to expectations	21.424	14.939	.820	.857	.840

Reliability Coefficients 5 items
Alpha = .888
Standardized item alpha = .891

II.2.D Control Variables

➢ Decision Complexity

TABLE II.2.D1: FACTOR ANALYSIS FOR DECISION COMPLEXITY
Rotated Component Matrix

	Items	1	2	3	4
1	The way to carry out the major activities involved in this decision was clear. (R)	.642	.363	-.464	-.007
2	We were fairly certain of what the outcomes of the decision would be. (R)	.806	.069	.375	.094
3	Difficult problems would arise during this decision, for which there were no apparent or immediate solutions.	.762	.078	-.051	.057
4	For this decision we relied on established procedures and practices. (R)	.142	.737	-.447	.223
5	We had to spend a lot of time solving problems encountered during this decision.	.878	.145	.042	-.260
6	The problems or issues we encountered in this decision were similar to those encountered in previous decisions. (R)	.076	.812	.255	.146
7	The process of making and implementing this decision could be described as routine. (R)	.377	.704	.045	.227
8	It took a lot of training and experience to deal with the problems encountered in this decision.	-.012	.108	-.012	.967
9	The problems encountered in this decision required extensive and demanding solutions.	.899	.177	.230	.087
10	The same work methods or steps were followed to resolve issues or problems in this decision as in previous decisions. (R)	.064	.859	.160	-.350
11	Overall this was a highly complex decision.	.338	.311	.766	-.015

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 47 iterations.

TABLE II.2.D2: RELIABILITY ANALYSIS DECISION COMPLEXITY – SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Coreltion	Squared Multiple Correlation	Alpha if Item Deleted
1	The way to carry out the major activities involved in this decision was clear. (R)	34.628	74.8286	.613	.502	.833
2	We were fairly certain of what the outcomes of the decision would be. (R)	33.371	77.416	.602	.629	.835
3	Difficult problems would arise during this decision, for which there were no apparent or immediate solutions.	34.200	78.517	.512	.435	.843
4	For this decision we relied on established procedures and practices. (R)	34.257	79.020	.477	.589	.847
5	We had to spend a lot of time solving problems encountered during this decision.	33.800	74.400	.588	.695	.836
6	The problems or issues we encountered in this decision were similar to those encountered in previous decisions. (R)	34.114	77.810	.512	.583	.843
7	The process of making and implementing this decision could be described as routine. (R)	33.000	71.705	.670	.570	.827
9	The problems encountered in this decision required extensive and demanding solutions.	33.685	74.986	.686	.774	.827
10	The same work methods or steps were followed to resolve issues or problems in this decision as in previous decisions. (R)	34.542	77.902	.512	.584	.843

Reliability Coefficients 9 items

Alpha = .853

Standardized item alpha = .854

Environmental Turbulence

TABLE II.2.D3: FACTOR ANALYSIS FOR ENVIRONMENTAL TURBULENCE
Rotated Component Matrix

	Items	1	2	3	4
1	In our kind of business, customers' product preferences change repeatedly over time.	.186	.246	.756	.096
2	Our customers tend to look for new products all the time.	.143	.080	.845	-.194
3	We are witnessing demand for our products and services from customers who never bought them before.	.064	-.068	.548	.673
4	New customers tend to have product-related needs that are different from those of our existing customers.	.098	.635	.297	.094
5	We cater to many of the same customers that we used to in the past. (R)	-.641	-.059	.276	.012
6	Competition in our industry is cutthroat.	.061	.741	.275	-.073
7	There are many "promotion wars" in our industry.	-.060	.839	.023	-.186
8	Anything that one competitor can offer, others can match readily.	.047	.756	.011	-.257
9	Price competition is a hallmark of our industry.	-.152	.729	-.266	.294
10	One hears of a new competitor almost every day.	.018	.127	.337	-.769
11	Our competitors are relatively weak. (R)	.029	-.021	.035	.643
12	The technology in our industry is changing rapidly.	.845	-.116	.294	-.062
13	Technological changes provide big opportunities in our industry.	.897	-.129	.030	.109
14	It is very difficult to forecast where the technology in our industry will be in the next 2 to 3 years.	.632	.402	.233	-.016
15	A large number of new product ideas have been made possible through technological breakthroughs in our industry.	.770	-.051	.190	-.035
16	Technological developments in our industry are rather narrow. (R)	.852	.113	.139	.068

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 5 iterations.

TABLE II.2.D4: RELIABILITY ANALYSIS FOR ENVIRONMENTAL TURBULENCE – SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	In our kind of business, customers' product preferences change repeatedly over time.	50.200	84.929	.535	.547	.722
2	Our customers tend to look for new products all the time.	50.085	86.433	.392	.596	.736
3	We are witnessing demand for our products and services from customers who never bought them before.	49.371	93.593	.181	.502	.758
4	New customers tend to have product-related needs that are different from those of our existing customers.	49.571	83.487	.532	.557	.720
6	Competition in our industry is cutthroat.	49.171	82.969	.501	.579	.723
7	There are many "promotion wars" in our industry.	49.571	84.840	.378	.652	.738
8	Anything that one competitor can offer, others can match readily.	49.142	87.008	.379	.554	.738
9	Price competition is a hallmark of our industry.	49.628	92.475	.147	.615	.767
12	The technology in our industry is changing rapidly.	49.285	85.504	.411	.798	.734
13	Technological changes provide big opportunities in our industry.	48.657	88.996	.304	.740	.746
14	It is very difficult to forecast where the technology in our industry will be in the next 2 to 3 years.	50.142	81.890	.605	.575	.712
15	A large number of new product ideas have been made possible through technological breakthroughs in our industry.	49.171	87.263	.362	.647	.740

Reliability Coefficients 12 items
Alpha = .754
Standardized item alpha = .759

APPENDIX III

MAIL SURVEY

APPENDIX III

MAIL SURVEY

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❖ *Appendix III.1 Mail Survey Covering Letter*

UNIVERSITY OF BATH
SCHOOL OF MANAGEMENT

Bath BA2 7AY · United Kingdom
Telephone +44 (0)1225 826742
Facsimile +44 (0)1225 826473

Director: Professor B T Bayliss

<Name>
<Address>

June 7, 2000

Dear CIM member,

Decision Making in the Information Age

We are writing to you to ask for your help in a research study we are currently conducting at the School of Management, University of Bath.

The information age is forcing us to reexamine virtually every aspect of management theory and practice: it threatens accepted notions of organizations as discrete entities, the nature of competition, organizational processes, and the role of managers in knowledge-intensive firms. Ongoing developments in information technology enable the delivery of ever more timely and detailed market information. However, a key question for organizations is whether this data explosion is matched by an ability to digest information and make effective strategic decisions.

One of our latest research priorities at the School of Management, University of Bath has been to understand the learning process in organizations and how decision-makers can make the best use of the market information generated. We would be most grateful if you could assist us in this important study by completing the enclosed questionnaire and returning it in the freepost envelope provided by June 25.

The questionnaire has been pilot tested and takes about 30 minutes to complete. For the purposes of the study we need you to refer to a strategic marketing decision you participated in and to the way market information was used in the decision-making process. Please rest assured that any information you provide is anonymous and will be treated in the strictest confidence.

We will send you a report of the results as soon as the survey is completed. Furthermore, all survey participants will be invited to a presentation of the findings and a discussion on the topic of decision-making in the information age.

We do hope you will be able to spare the time to participate in this study.

Yours sincerely,

Dr. Pierre Berthon
Professor of Marketing

Ms. Areti Krepapa
Research Director

For any enquiries please contact Ms. Areti Krepapa (01222) 703468 or e-mail: mnspb@management.bath.ac.uk

❖ ***Appendix III.2 Mail Survey Questionnaire***

MARKET INFORMATION & DECISION MAKING

Thank you for taking the time to complete this questionnaire. Your responses are confidential and will be used in a research study concerning market information and decision-making. For each of the statements listed below, please indicate the extent to which you agree or disagree by circling the appropriate number on the scale, where 1 indicates strong disagreement and 7 strong agreement. The questionnaire should take you about 30 minutes to complete.

SECTION I: DECISION MAKING

1.For every question we need you to refer to a specific marketing decision that you participated in. Please briefly describe below the most recent strategic marketing decision that was made and implemented in your company, and for which performance indications are available:

.....

.....

.....

2. Prior to initiating the decision making process and before acquiring any new information for this decision, compared to *other firms* in your industry, please indicate the extent to which in your company:	**ot a ll**					**To a Great Extent**
1. There already existed a significant amount of information about the issues surrounding the decision.	2	3	4	5	6	7
2. There already existed a great amount of existing knowledge pertaining to this decision.	2	3	4	5	6	7
3. There already existed a great amount of stored data for this kind of decision.	2	3	4	5	6	7
4. There already existed a great deal of experience concerning similar decisions.	2	3	4	5	6	7
5. There already existed a great deal of familiarity with this kind of decision.	2	3	4	5	6	7
6. There already existed a great deal of expertise in dealing with such projects.	2	3	4	5	6	7

3. Thinking about the overall complexity level of this decision-making process, please indicate the extent to which each statement describes the situation.	**ot ll**					**o a Great Extent**
1. The way to carry out the major activities involved in this decision was clear.	2	3	4	5	6	7
2. Most of the time we felt fairly sure of what the outcomes of this decision would be.	2	3	4	5	6	7
3. Difficult problems would arise in this decision, for which there were no apparent or immediate solutions.	2	3	4	5	6	7
4. We spend a lot of time solving problems encountered during this decision.	2	3	4	5	6	7
5. The problems encountered in this decision required extensive and demanding solutions.	2	3	4	5	6	7
6. The process of making and implementing this decision could be described as routine.	2	3	4	5	6	7
7. The issues we encountered in this decision were similar to those encountered in previous decisions.	2	3	4	5	6	7
8. For this decision we relied on established procedures and practices.	2	3	4	5	6	7
9. The same methods were followed to resolve issues or problems in this decision as in previous decisions.	2	3	4	5	6	7

4. How would you rate the performance level of this decision?	**Very Low**						**Very High**
1. Overall decision performance compared to expectations.	1	2	3	4	5	6	7
2. Overall decision success.	1	2	3	4	5	6	7
3. Positive effect on organizational performance.	1	2	3	4	5	6	7
4. Net profits relative to expectations	1	2	3	4	5	6	7
5. Sales relative to expectations	1	2	3	4	5	6	7

5. With reference to the overall quality of this decision, please indicate the extent to which you agree or disagree with the following statements:	**ot at ll**						**To a Great Extent**
1. The decision made sense in light of the organization's market position.		2	3	4	5	6	7
2. The decision was based on valid assumptions.		2	3	4	5	6	7
3. The decision was made and implemented in a timely manner.		2	3	4	5	6	7
4. The decision was widely supported in the organization.		2	3	4	5	6	7
5. The decision was consistent with the organization's overall marketing strategy.		2	3	4	5	6	7
6. The decision significantly contributed to the overall competitiveness of the organization.		2	3	4	5	6	7
7. The decision was well aligned with the overall strategic objectives of the organization.		2	3	4	5	6	7
8. Overall this was a high quality decision.		2	3	4	5	6	7

6. In evaluating the creativity of this decision, please indicate the extent to which you agree or disagree with the following statements:	**Not at All**						**To a Great Extent**
1. The decision was very different from others developed in the past in the organization.	1	2	3	4	5	6	7
2. The decision broke some of the "rules of the game" within the market.	1	2	3	4	5	6	7
3. The decision broke some of the "rules of the game" within the company	1	2	3	4	5	6	7
4. The decision involved creative thinking.	1	2	3	4	5	6	7
5. The decision was quite novel for the organization.	1	2	3	4	5	6	7
6. Overall this was an innovative decision.	1	2	3	4	5	6	7

SECTION II: COLLECTING AND ANALYZING MARKET INFORMATION FOR DECISION MAKING

1. Thinking about the amount of market information that was acquired for this decision, to what extent do you agree or disagree with the following statements?	**Strongl Disagre**						**Strongly Agree**
1. We made a considerable investment in the collection of information for this decision.		2	3	4	5	6	7
2. We acquired sufficient information to address the issues arising during this decision.		2	3	4	5	6	7
3. We collected all possible information before making the decision.		2	3	4	5	6	7
4. We needed more information to deal with the issues arising during the decision.		2	3	4	5	6	7
5. We collected extensive information on our customers' needs for this decision.		2	3	4	5	6	7
6. Intelligence collected on our competitors, for this decision, was comprehensive.		2	3	4	5	6	7
7. We systematically reviewed the conditions in our business environment that may have impacted this decision (e.g. competition, technology, regulation).		2	3	4	5	6	7
8. We collected industry information to detect any fundamental shifts that could impact this decision.		2	3	4	5	6	7

2. Thinking about the content of the market information collected for this decision, to what extent do you personally agree or disagree with the following statements	**Strongly Disagree**						**Strongl y Agree**
1. The information conveyed conflicting signals.	1	2	3	4	5	6	7
2. The information conveyed contradictory statements and findings.	1	2	3	4	5	6	7
3. The information was ambiguous.	1	2	3	4	5	6	7

3. Strategic decision-making is typically a process involving a number of managers, rather than just one individual. Managers evaluate the available information based on their own experiences, preferences and standards. During the process of making this decision to what extent…	**Not at All**						**To a Great Extent**
1. Did decision-makers *disagree* about the overall credibility of the information?	1	2	3	4	5	6	7
2. Did decision-makers *disagree* about the reliability of the information?	1	2	3	4	5	6	7
3. Did decision-makers *disagree* about the timeliness of the information?	1	2	3	4	5	6	7
4. Did decision-makers *disagree* about the relevance of the information for the decision at hand?	1	2	3	4	5	6	7
5. Did decision-makers *disagree* about the clarity of the information?	1	2	3	4	5	6	7
6. Did decision-makers *disagree* about the applicability of the information?	1	2	3	4	5	6	7
7. Did decision-makers *disagree* about the innovativeness of the information?	1	2	3	4	5	6	7

4. During the process of analyzing information, decision-makers are likely to interpret the information in different ways, bringing their own different perspectives to the situation. In the process of making the decision you described in Section I, to what extent…	**Not at All**						**To a Great Extent**
1. Did decision-makers challenge each other's opinions of what the information meant?		2	3	4	5	6	7
2. Were different opinions about the implications of the information expressed among decision-makers?		2	3	4	5	6	7
3. Did the collected information sometimes mean different things to different people?		2	3	4	5	6	
4. Were there disagreements over different ideas about the content of the information?		2	3	4	5	6	7
5. Was the information analyzed from many different perspectives?		2	3	4	5	6	7
6. Were there differences in the interpretation of the market information among decision-makers?		2	3	4	5	6	7
7. Did decision-makers voice dissent while analyzing the information?		2	3	4	5	6	7
8. Were different solutions produced as a result of the different understanding of the information among decision-makers?		2	3	4	5	6	7
9. Was information interpreted in different ways by the decision-makers?		2	3	4	5	6	7

5. Because during decision-making different people bring their own different perspectives to the situation, the interpretation of market information by a group of decision-makers can sometimes result in changes in the way of thinking about the decision. Thinking about the way in which the group process of analyzing the collected information influenced this decision, please indicate the extent to which each statement describes the situation.	**ot at ll**						**To Gre Exte**
1. The group information analysis process revealed opportunities/problems that were not considered before.		2	3	4	5	6	7
2. The group information analysis process prompted a re-examination of previously held assumptions relating to this decision.		2	3	4	5	6	7
3. The group information analysis process provided novel insight in setting specific goals and objectives for this decision.		2	3	4	5	6	7
4. The group information analysis process helped produce a wider range of alternatives for this decision.		2	3	4	5	6	7
5. The group information analysis process uncovered ideas about this decision that were not considered before.		2	3	4	5	6	7
6. The group information analysis process prompted a critical re-evaluation of previous recommendations relating to this decision.		2	3	4	5	6	7
7. The group information analysis process provided distinct directions in selecting amongst alternative options.		2	3	4	5	6	7
8. The group information analysis process resulted in selecting an original course of action.		2	3	4	5	6	7

SECTION III: ORGANIZATIONAL ENVIRONMENT

1. Thinking about the degree of hierarchy in your organization's decision-making processes, to what extent…	**Not a All**						**To a Great Extent**
1. Can the process of making strategic decisions be characterized as participative?	2	3	4	5	6	7	
2. Are views other than those of the top management included in the strategic decision processes?	2	3	4	5	6	7	
3. Do people affected by a decision typically feel that the definition of the issue(s) and/or the manner in which it was resolved was imposed upon them?	2	3	4	5	6	7	
4. Does strategic decision-making tend to be made only at senior management levels?	2	3	4	5	6	7	
5. Do top managers make decisions without consulting with anyone else?	2	3	4	5	6	7	
6. Are people allowed flexibility in making their own decisions on matters involving their work?	2	3	4	5	6	7	

2. Thinking about the degree of formality of decision making in your organization, to what extent…	**Not a All**						**To a Great Extent**
1. Are written rules and procedures followed during decision making?	2	3	4	5	6	7	
2. Do people make their own rules on the job?	2	3	4	5	6	7	
3. Can decision-making be characterized as a process dominated by formal rules and procedures?	2	3	4	5	6	7	
4. Is there a standard operating procedure for major decisions?	2	3	4	5	6	7	
5. Must plans be rigidly followed throughout the decision-making process?	2	3	4	5	6	7	

3. Thinking about the overall culture and climate in your organization, please indicate the extent to which you agree or disagree with the following statements:	**Strongly Disagree**						**Strongly Agree**
1. Our organization is dynamic and entrepreneurial.	1	2	3	4	5	6	7
2. There is strong emphasis on innovation and change.	1	2	3	4	5	6	7
3. The management of this organization actively seeks innovative ideas.	1	2	3	4	5	6	7
4. There is commitment to continuous innovation and improvement.	1	2	3	4	5	6	7
5. Management is always willing to consider and adopt new ideas.	1	2	3	4	5	6	7
6. There is an eagerness to take risks.	1	2	3	4	5	6	7

4. With reference to the nature of interaction among the decision-makers, to what extent…	**Not at All**						**To a Great Extent**
1. Did the key people involved in this decision interact on an ongoing basis during the decision-making process?	2	3	4	5	6	7	
2. Did individuals in the decision-making group interact with each other on an informal basis?	2	3	4	5	6	7	
3. Can the process of making this decision be characterized as interactive?	2	3	4	5	6	7	
4. Was there a free and open exchange of ideas among decision-makers about strategic issues?	2	3	4	5	6	7	
5. Were there extensive formal and informal communications during decision-making?	2	3	4	5	6	7	
6. Were the decision's objectives communicated clearly to all the involved and concerned parties?	2	3	4	5	6	7	

5. Regarding the co-operation between the different departments for this decision, to what extent…	**Not a All**						**To a Great Extent**
1. Did your department achieve goals in co-operation with other departments?	1	2	3	4	5	6	7
2. Did members of your department informally work together with people from other departments?	1	2	3	4	5	6	7
3. Did your department share information, and/or resources with other departments?	1	2	3	4	5	6	7
4. Did people from different departments work together as a team?	1	2	3	4	5	6	7
5. Did you experience problems coordinating work activities between the different departments?	1	2	3	4	5	6	7

6. Political activity is present in one form or another in most organizations. With reference to the decision making process you mentioned in section one, to what extent …	**Not at All**						**To a Great Extent**
1. Were decision-makers primarily concerned with their personal goals rather than with the goals of the organization?	1	2	3	4	5	6	7
2. Was decision-making affected by the use of power among decision-makers?	1	2	3	4	5	6	
3. Was the decision affected by bargaining among decision-makers?	1	2	3	4	5	6	7
4. Can decision-making be characterized as the "give and take" of different interests and factions?	1	2	3	4	5	6	7
5. Did decision-makers join forces or form alliances with other people or departments to "push through" their points of view?	1	2	3	4	5	6	7
6. Were people open with each other about their personal interests in this decision?	1	2	3	4	5	6	7

SECTION IV: INDUSTRY CONDITIONS

In assessing the conditions in the industry your organization is competing, please indicate the extent to which you agree or disagree with the following statements:	**Strongl Disagre**						**Strongly Agree**
1. In our kind of business, customers' product preferences change repeatedly over time.		2	3	4	5	6	7
2. Our customers tend to look for new products all the time.		2	3	4	5	6	7
3. We are witnessing demand for our products and services from customers who never bought them before.		2	3	4	5	6	7
4. New customers tend to have product-related needs that are different from those of our existing customers.		2	3	4	5	6	7
5. Competition in our industry is cutthroat.		2	3	4	5	6	7
6. There are many "promotion wars" in our industry.		2	3	4	5	6	7
7. Anything that one competitor can offer others can match readily.		2	3	4	5	6	7
8. Price competition is a hallmark of our industry.		2	3	4	5	6	7
9. The technology in our industry is changing rapidly.		2	3	4	5	6	7
10. Technological changes provide big opportunities in our industry.		2	3	4	5	6	7
11. It is very difficult to forecast where the technology in our industry will be in the next 2 to 3 years.		2	3	4	5	6	7
12. A lot of new product ideas have been made possible through technological breakthroughs in our industry.		2	3	4	5	6	7

SECTION VII: ADDITIONAL INFORMATION

Age of Organization:_____

Your Position:_____

No. of Employees in Organization:_____

No of years in the Organization_____

Industry of Organization:_____

THANK YOU VERY MUCH FOR YOUR PARTICIPATION!
YOUR CONTRIBUTION IS GREATLY APPRECIATED

❖ ***Appendix III.3 Mail Survey Reminder Letter***

<Name>
<Address>

UNIVERSITY OF BATH
SCHOOL OF MANAGEMENT

Bath BA2 7AY · United Kingdom
Telephone +44 (0)1225 826742
Facsimile +44 (0)1225 826473

Director: Professor B T Bayliss

June 28, 2000

Dear CIM.member,

RE: Decision Making in the Information Age

Recently, we asked for your help on a large-scale study about the use of market information in decision-making that the School of Management at the University of Bath is currently conducting.

If you have already returned the questionnaire, we would like to apologize for contacting you again and take this opportunity to thank you for your time and effort.

If, on the other hand, you have not yet had the chance to complete the questionnaire, we would be extremely grateful, if you could devote some time to do so. We are well aware that we are imposing on your busy schedule, but your participation is critical for the accuracy of our research and could make the difference between success and failure of this study.

Once more, please rest assured that any information you provide will be treated in the strictest confidence and that all questionnaire replies are anonymous. Moreover, as a token of our appreciation, we will be able to arrange a presentation of the findings for you and also provide you with an analytical report of the research results.

Thank you very much for your co-operation. Your support is greatly appreciated.

Yours sincerely,

Dr. Pierre Berthon
Professor of Marketing

Ms. Areti Krepapa
Project Research Director

For any enquiries please contact Ms. Areti Krepapa (01222) 703468 or e-mail: mnspb@management.bath.ac.uk

❖ *Appendix III.4 Mail Survey Initial Data Analysis*

III.4.A Organizational Context Variables

➢ Centralization

TABLE III.4.A1: FACTOR ANALYSIS FOR CENTRALIZATION
Component Matrix

	Items	1
1	Can the process of making strategic decisions be characterized as participative? (R)	.835
2	Are views other than those of the top management included in the strategic decision processes?(R)	.784
3	Do people affected by a decision typically feel that the definition of the issue(s) and/or the manner in which it was resolved was imposed upon them?	.702
4	Does strategic decision-making tend to be made only at senior management levels?	.565
5	Do top managers make decisions without consulting with anyone else?	.698
6	Are people allowed flexibility in making their own decisions in matters involving their work? (R)	.612
Eigenvalue		2.98
Percentage of Variance Explained		49.7

Extraction Method: Principal Component Analysis.
1 component extracted.

Table III.4.A2: Reliability Analysis For Centralization– Scale (Alpha)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	Can the process of making strategic decisions be characterized as participative? (R)	19.346	34.195	.700	.548	.724
2	Are views other than those of the top management included in the strategic decision processes?(R)	19.463	34.698	.629	.487	.741
3	Do people affected by a decision typically feel that the definition of the issue(s) and/or the manner in which it was resolved was imposed upon them?	18.564	36.984	.550	.322	.761
4	Does strategic decision-making tend to be made only at senior management levels?	17.578	39.705	.417	.212	.791
5	Do top managers make decisions without consulting with anyone else?	18.657	35.390	.545	.304	.763
6	Are people allowed flexibility in making their own decisions in matters involving their work? (R)	19.594	40.573	.444	.247	.784

Reliability Coefficients 6 items
Alpha = .794
Standardized item alpha = .792

➢ Formalization

TABLE III.4.A3: FACTOR ANALYSIS FOR FORMALIZATION
Component Matrix

	Items	1
1	Are written rules and procedures followed during decision-making?	.861
2	Do people make their own rules on the job? (R)	.477
3	Can decision-making be characterized as a process dominated by formal rules and procedures?	.803
4	Is there a standard operating procedure for major decisions?	.814
5	Must plans be rigidly followed throughout the decision-making process?	.820
Eigenvalue		2.949
Percentage of Variance Explained		58.973

Extraction Method: Principal Component Analysis.
1 component extracted.

TABLE III.4.A4: RELIABILITY ANALYSIS FOR FORMALIZATION – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	Are written rules and procedures followed during decision-making?	14.156	24.897	.735	.565	.742
2	Do people make their own rules on the job? (R)	13.559	32.402	.338	.117	.853
3	Can decision-making be characterized as a process dominated by formal rules and procedures?	14.382	27.254	.650	.470	.770
4	Is there a standard operating procedure for major decisions?	13.492	25.024	.668	.486	.764
5	Must plans be rigidly followed throughout the decision-making process?	14.294	27.238	.674	.488	.764

Reliability Coefficients 5 items
Alpha = .818
Standardized item alpha = .816

➢ Innovative Culture

TABLE III.4.A4: FACTOR ANALYSIS FOR INNOVATIVE CULTURE
Component Matrix

	Items	1
1	Our organization is dynamic and entrepreneurial.	.886
2	There is strong emphasis on innovation and change.	.887
3	The management of this organization actively seeks innovative ideas.	.896
4	There is commitment to continuous innovation and improvement.	.886
5	Management is always willing to consider and adopt new ideas.	.872
6	There is an eagerness to take risks.	.785
Eigenvalue		4.535
Percentage of Variance Explained		75.579

Extraction Method: Principal Component Analysis.
1 component extracted.

TABLE II.2.A5: RELIABILITY ANALYSIS FOR INNOVATIVE CULTURE– SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Coreltion	Squared Multiple Correlatio n	Alpha if Item Deleted
1	Our organization is dynamic and entrepreneurial.	22.895	50.598	.833	.717	.917
2	There is strong emphasis on innovation and change.	22.749	51.524	.829	.721	.918
3	The management of this organization actively seeks innovative ideas.	22.652	52.504	.839	.726	.917
4	There is commitment to continuous innovation and improvement.	22.464	53.300	.824	.726	.919
5	Management is always willing to consider and adopt new ideas.	22.493	53.721	.808	.691	.921
6	There is an eagerness to take risks.	23.648	53.363	.705	.532	.935

Reliability Coefficients 6 items
Alpha = .934
Standardized item alpha = .935

➢ Interdepartmental Integration: Interaction & Collaboration

TABLE III.4.A6: FACTOR ANALYSIS FOR INTERDEPARTMENTAL INTEGRATION
Rotated Component Matrix

	Items	1	2	3
	Interaction			
1	Did the key people involved in this decision interact on an ongoing basis during the decision-making process?	.829	.243	.035
2	Did individuals in the decision-making group interact with each other on an informal basis?	.786	.157	-.059
3	Can the process of making this decision be characterized as interactive?	.864	.212	.032
4	Was there a free and open exchange of ideas among decision-makers about strategic issues?	.764	.258	.170
5	Were there extensive formal and informal communications during decision-making?	.839	.194	-.053
6	Were the decision's objectives and goals communicated clearly to all the involved and concerned parties?	.599	.325	.250
	Collaboration			
1	Did your department achieve goals collectively with other departments?	.221	.799	.254
2	Did members of your department informally work together with people from other departments?	.254	.817	-.067
3	Did your department share information, and/or resources with other departments?	.213	.862	.027
4	Did people from different departments work together as a team?	.261	.835	.060
5	Did you experience problems coordinating work activities between the different departments? (R)	.043	.087	.96
Eigenvalue		5.474	1.632	1.010
Percentage of Variance Explained		49.77	14.84	9.19

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 4 iterations.

TABLE III.4.A7: RELIABILITY ANALYSIS FOR INTERDEPARTMENTAL INTEGRATION – SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Coreltion	Squared Multiple Correlatio n	Alpha if Item Deleted
1	Did the key people involved in this decision interact on an ongoing basis during the decision-making process?	50.636	94.539	.711	.665	.868
2	Did individuals in the decision-making group interact with each other on an informal basis?	50.472	97.375	.599	.554	.875
3	Can the process of making this decision be characterized as interactive?	50.530	94.026	.718	.704	.867
4	Was there a free and open exchange of ideas among decision-makers about strategic issues?	50.421	93.207	.695	.588	.868
5	Were there extensive formal and informal communications during decision-making?	50.648	94.458	.661	.625	.871
6	Were the decision's objectives and goals communicated clearly to all the involved and concerned parties?	50.614	95.639	.618	.448	.873
7	Did your department achieve goals collectively with other departments?	50.685	95.756	.647	.596	.872
8	Did members of your department informally work together with people from other departments?	50.525	95.241	.617	.584	.873
9	Did your department share information, and/or resources with other departments?	50.322	96.934	.637	.619	.873
10	Did people from different departments work together as a team?	50.629	92.537	.659	.628	.871
11	Did you experience problems coordinating work activities between the different departments? (R)	51.669	106.04	.171	.111	.905

Reliability Coefficients 11 items
Alpha = .885
Standardized item alpha = .891

➢ Political Behavior

TABLE III.4.A8: FACTOR ANALYSIS FOR POLITICAL BEHAVIOR

Rotated Component Matrix

	Items	1	2
1	Were decision-makers primarily concerned with their personal goals rather than with the goals of the organization?	.360	.749
2	Was decision-making affected by the use of power among decision-makers?	.387	.749
3	Was the decision affected by bargaining among decision-makers?	.752	.358
4	Can decision-making be characterized as the "give and take" of different interests and factions?	.847	-.093
5	Did decision-makers join forces or form alliances with other people or departments to "push through" their points of view?	.735	.374
6	Were people open with each other about their personal interests in this decision? (R)	-.090	.820
Eigenvalue		3.041	1.139
Percentage of Variance Explained		50.684	18.980

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE III.4.A9: RELIABILITY ANALYSIS FOR POLITICAL BEHAVIOR – SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Coreltion	Squared Multiple Correlatio n	Alpha if Item Deleted
1	Were decision-makers primarily concerned with their personal goals rather than with the goals of the organization?	19.465	36.389	.637	.495	.746
2	Was decision-making affected by the use of power among decision-makers?	18.931	36.207	.669	.515	.739
3	Was the decision affected by bargaining among decision-makers?	19.760	37.706	.645	.472	.746
4	Can decision-making be characterized as the "give and take" of different interests and factions?	19.160	43.308	.375	.276	.804
5	Did decision-makers join forces or form alliances with other people or departments to "push through" their points of view?	19.546	35.924	.643	.470	.744
6	Were people open with each other about their personal interests in this decision? (R)	19.194	42.770	.358	.225	.809

Reliability Coefficients 6 items
Alpha = .798
Standardized item alpha = .795

TABLE III.4.A10: RELIABILITY ANALYSIS FOR POLITICAL BEHAVIOR – SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Coreltion	Squared Multiple Correlatio n	Alpha if Item Deleted
1	Were decision-makers primarily concerned with their personal goals rather than with the goals of the organization?	11.396	18.954	.655	.481	.764
2	Was decision-making affected by the use of power among decision-makers?	10.862	19.314	.650	.479	.766
3	Was the decision affected by bargaining among decision-makers?	11.690	20.329	.634	.438	.774
5	Did decision-makers join forces or form alliances with other people or departments to "push through" their points of view?	11.477	19.116	.621	.430	.781

Reliability Coefficients 4 items
Alpha = .8185
Standardized item alpha = .8192

➢ Organizational Memory: Declarative & Procedural

TABLE III.4.A11: FACTOR ANALYSIS FOR ORGANIZATIONAL MEMORY
Rotated Component Matrix

	Items	1	2
	Declarative		
1	There already existed a significant amount of information about the issues surrounding the decision.	.112	.875
2	There already existed a great deal of existing knowledge pertaining to this decision.	.322	.829
3	There already existed a great deal of stored data for this kind of decision.	.215	.799
	Procedural		
4	There already existed a great deal of experience concerning similar decisions.	.821	.308
5	There already existed a great deal of familiarity with this kind of decision.	.910	.203
6	There already existed a great deal of expertise in dealing with such projects.	.892	.150
Eigenvalue		3.468	1.242
Percentage of Variance Explained		57.801	20.692

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE III.4.A12: RELIABILITY ANALYSIS FOR ORGANIZATIONAL MEMORY – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	There already existed a significant amount of information about the issues surrounding the decision.	18.762	46.596	.543	.498	.844
2	There already existed a great deal of existing knowledge pertaining to this decision.	18.769	44.212	.696	.596	.816
3	There already existed a great deal of stored data for this kind of decision.	19.681	45.683	.571	.422	.839
4	There already existed a great deal of experience concerning similar decisions.	19.227	44.048	.699	.597	.815
5	There already existed a great deal of familiarity with this kind of decision.	19.092	43.054	.691	.704	.816
6	There already existed a great deal of expertise in dealing with such projects.	19.050	44.247	.626	.621	.829

Reliability Coefficients 6 items
Alpha = .852
Standardized item alpha = .853

➢ Organizational Context Variables

TABLE III.4.A13: FACTOR ANALYSIS FOR ORGANIZATIONAL CONTEXT VARIABLES
Rotated Component Matrix

	1	2	3	4	5	6	7	8
Centralization1R	-.370	-.292	-.165	-.001	.631	.088	.032	-.078
Centralization 2R	-.326	-.149	-.286	-.066	.583	.183	-.022	-.027
Centralization 3	-.217	-.173	-.010	.091	.624	.287	.026	-.018
Centralization 4	.002	.014	-.064	.050	.732	.022	-.102	-.110
Centralization 5	-.117	-.264	-.198	-.006	.622	.106	.034	.031
Centralization 6R	-.289	-.203	-.110	.063	.405	.070	.079	-.109
Formalization1	-.026	.077	.080	.859	-.039	.015	.056	.051
Formalization 3	-.105	-.176	-.002	.781	.096	.081	.023	.094
Formalization 4	.027	.108	.023	.818	-.054	.035	.148	.013
Formalization 5	-.083	-.051	.017	.830	.112	.077	.004	.034
Culture1	.841	.158	.050	-.114	-.150	-.128	.046	.021
Culture 2	.841	.214	.099	-.034	-.100	-.026	.091	.057
Culture 3	.869	.121	.104	-.020	-.129	-.096	-.018	.072
Culture 4	.821	.243	.122	.040	-.131	-.120	.051	.087
Culture 5	.802	.214	.133	.034	-.172	-.183	.058	.052
Culture 6	.751	.089	-.002	-.135	-.150	-.118	.152	-.050
Interaction1	.191	.800	.222	.012	-.145	-.044	.030	-.049
Interaction 2	.117	.805	.148	-.109	-.018	.020	.051	.097
Interaction 3	.242	.796	.161	-.019	-.278	-.081	.043	.010
Interaction 4	.218	.690	.228	-.009	-.270	-.179	.008	-.019
Interaction 5	.196	.802	.170	.023	-.105	.017	.042	.158
Interaction 6	.261	.524	.312	.144	-.144	-.157	.036	.090
Collaboration1	.062	.206	.798	.043	-.157	-.142	.063	.055
Collaboration 2	.011	.286	.797	-.011	-.076	-.003	.070	-.015
Collaboration 3	.132	.181	.836	.067	-.204	-.006	-.003	.007
Collaboration 4	.226	.225	.806	.029	-.104	-.042	.090	.025
Politics1	-.175	-.151	-.017	.002	.279	.727	-.062	-.048
Politics2	-.260	-.049	-.058	-.005	.302	.708	-.034	.014
Politics3	-.099	-.051	-.128	.089	-.002	.814	.041	.002
Politics5	-.059	.005	.005	.109	.033	.816	.076	-.035
Declarative Memory1	.066	.056	-.011	.055	-.109	-.083	.116	[illegible]
Declarative Memory2	.103	.093	.001	-.055	-.092	-.001	.330	[illegible]
Declarative Memory3	.015	.061	.074	.188	-.017	.021	.203	[illegible]
Procedural Memory4	.149	-.048	.028	.137	-.010	.006	[illegible]	.308
Procedural Memory5	.034	.057	.053	.051	.014	.005	[illegible]	.198
Procedural Memory6	.105	.118	.114	.074	-.016	.041	[illegible]	.137

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 7 iterations.

III.4.B Learning Process Variables

➢ Scanning

TABLE III.4.B1: FACTOR ANALYSIS FOR SCANNING
Rotated Component Matrix

	Items	1	2
1	We made a significant investment in the collection of information for this decision.	.691	-.116
2	We acquired sufficient information to address the issues arising during this decision.	.736	.359
3	We collected all possible information before making the decision.	.683	.209
4	We needed more information to deal with the issues arising during the decision. (R)	-.040	.962
5	We collected extensive information on our customers' needs for this decision.	.658	-.086
6	Intelligence collected on our competitors, for this decision, was comprehensive.	.711	-.025
7	We systematically reviewed the conditions in our business environment that may have impacted this decision (e.g. competition, technology, regulation).	.769	.074
8	We collected industry information to detect any fundamental shifts that could impact this decision.	.795	-.073
Eigenvalue		3.67	1.11
Percentage of Variance Explained		45.83	13.92

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE III.4.B2: RELIABILITY ANALYSIS FOR SCANNING – SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	We made a significant investment in the collection of information for this decision.	31.188	56.077	.519	.351	.770
2	We acquired sufficient information to address the issues arising during this decision.	30.469	56.919	.682	.476	.750
3	We collected all possible information before making the decision.	31.394	55.636	.583	.366	.759
4	We needed more information to deal with the issues arising during the decision. (R)	31.499	69.648	.016	.128	.843
5	We collected extensive information on our customers' needs for this decision.	30.713	57.522	.494	.294	.774
6	Intelligence collected on our competitors, for this decision, was comprehensive.	30.946	55.131	.564	.361	.762
7	We systematically reviewed the conditions in our business environment that may have impacted this decision (e.g. competition, technology, regulation).	30.467	56.124	.648	.494	.752
8	We collected industry information to detect any fundamental shifts that could impact this decision.	30.787	53.501	.633	.531	.750

Reliability Coefficients 8 items
Alpha = .795
Standardized item alpha = .802

➢ Interpretive Diversity: Content & Frame

TABLE III.4.B3: FACTOR ANALYSIS FOR INTERPRETIVE DIVERSITY
Rotated Component Matrix

	Items	1	2
	Interpretive Diversity of Content		
1	Did decision-makers challenge each other's opinions of what the information meant?	.192	.749
2	Were different opinions about the implications of the information expressed among decision-makers?	.211	.743
3	Did the collected information sometimes mean different things to different people?	.308	.705
4	Were there disagreements over different ideas about the content of the information?	.396	.692
5	Was the information analyzed from many different perspectives?	-.044	.644
6	Were there differences in the interpretation of the market information among decision-makers?	.449	.637
7	Did decision-makers voice dissent while analyzing the information?	.422	.619
8	Were different solutions produced as a result of the different understanding of the information among decision-makers?	.162	.635
9	Was information interpreted in different ways by the decision-makers?	.456	.679
	Interpretive Diversity of Frame		
1	Did decision-makers *disagree* about the overall credibility of the information?	.722	.270
2	Did decision-makers *disagree* about the reliability of the information?	.780	.226
3	Did decision-makers *disagree* about the timeliness of the information?	.723	.179
4	Did decision-makers *disagree* about the relevance of the information for the decision at hand?	.777	.150
5	Did decision-makers *disagree* about the clarity of the information?	.773	.246
6	Did decision-makers *disagree* about the applicability of the information?	.771	.222
7	Did decision-makers *disagree* about the innovativeness of the information?	.667	.222
Eigenvalue		7.52	1.8
Percentage of Variance Explained		47.01	11.33

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

TABLE III.4.B4: RELIABILITY ANALYSIS FOR INTERPRETIVE DIVERSITY– SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	Did decision-makers challenge each other's opinions of what the information meant?	55.906	255.167	.609	.580	.916
2	Were different opinions about the implications of the information expressed among decision-makers?	55.684	254.756	.618	.611	.916
3	Did the collected information sometimes mean different things to different people?	55.893	252.359	.656	.548	.915
4	Were there disagreements over different ideas about the content of the information?	56.406	246.588	.717	.589	.913
5	Was the information analyzed from many different perspectives?	56.007	261.643	.368	.285	.923
6	Were there differences in the interpretation of the market information among decision-makers?	56.448	248.837	.714	.632	.913
7	Did decision-makers voice dissent while analyzing the information?	56.819	242.216	.685	.537	.914
8	Were different solutions produced as a result of the different understanding of the information among decision-makers?	56.477	253.099	.509	.379	.920
9	Was information interpreted in different ways by the decision-makers?	56.258	245.172	.755	.670	.912
10	Did decision-makers *disagree* about the overall credibility of the information?	57.120	251.417	.647	.567	.915
11	Did decision-makers *disagree* about the reliability of the information?	57.313	253.906	.659	.631	.915
12	Did decision-makers *disagree* about the timeliness of the information?	57.582	257.301	.586	.482	.917
13	Did decision-makers *disagree* about the relevance of the information for the decision at hand?	57.473	253.950	.600	.555	.916
14	Did decision-makers *disagree* about the clarity of the information?	57.305	251.053	.669	.571	.914
15	Did decision-makers *disagree* about the applicability of the information?	57.246	252.161	.647	.567	.915
16	Did decision-makers *disagree* about the innovativeness of the information?	57.599	256.589	.573	.427	.917

Reliability Coefficients 16 items
Alpha = .9209
Standardized item alpha = .923

➢ Adaptation

TABLE III.4.B5: FACTOR ANALYSIS FOR ADAPTATION

Component Matrix

	Items	1
1	The group information analysis process revealed opportunities/problems that were not considered before.	.715
2	The group information analysis process prompted a re-examination of previously held assumptions relating to this decision.	.764
3	The group information analysis process provided novel insight in setting specific goals and objectives for this decision.	.709
4	The group information analysis process helped produce a wider range of alternatives for this decision.	.729
5	The group information analysis process uncovered ideas about this decision that were not considered before.	.794
6	The group information analysis process prompted a critical re-evaluation of previous recommendations relating to this decision.	.707
7	The group information analysis process provided distinct directions in selecting amongst alternative options.	.705
8	The group information analysis process resulted in selecting an original course of action.	.402
Eigenvalue		3.92
Percentage of Variance Explained		48.98

Extraction Method: Principal Component Analysis.
1 component extracted.

TABLE II.2.B6: RELIABILITY ANALYSIS FOR ADAPTATION– SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squar. Multip. Correlation	Alpha if Item Deleted
1	The group information analysis process revealed opportunities/problems that were not considered before.	30.491	58.645	.594	.436	.821
2	The group information analysis process prompted a re-examination of previously held assumptions relating to this decision.	30.639	57.120	.649	.490	.814
3	The group information analysis process provided novel insight in setting specific goals and objectives for this decision.	30.916	58.296	.602	.363	.820
4	The group information analysis process helped produce a wider range of alternatives for this decision.	30.983	56.319	.619	.404	.817
5	The group information analysis process uncovered ideas about this decision that were not considered before.	30.706	55.600	.689	.498	.808
6	The group information analysis process prompted a critical re-evaluation of previous recommendations relating to this decision.	31.362	55.496	.590	.376	.821
7	The group information analysis process provided distinct directions in selecting amongst alternative options.	30.857	56.430	.584	.373	.822
8	The group information analysis process resulted in selecting an original course of action.	30.635	62.829	.309	.111	.857

Reliability Coefficients 8 items
Alpha = .842
Standardized item alpha = .845

➢ Learning Process Variables

TABLE III.4.B7: FACTOR ANALYSIS FOR LEARNING PROCESS VARIABLES
Rotated Component Matrix

	1	2	3	4
Scanning 1	-.050	.203	.124	.637
Scanning 2	-.217	.057	.190	.717
Scanning 3	-.169	-.045	.023	.694
Scanning 5	.138	-.128	.155	.670
Scanning 6	-.067	.027	.019	.706
Scanning 7	.000	.078	.145	.761
Scanning 8	-.016	.160	.126	.757
Interpretive Diversity: Content 1	.205	.678	.203	.202
Interpretive Diversity: Content 2	.222	.693	.152	.181
Interpretive Diversity: Content 3	.246	.769	.068	.013
Interpretive Diversity: Content 4	.345	.712	.177	.021
Interpretive Diversity: Content 5	.042	.433	.350	.271
Interpretive Diversity: Content 6	.388	.667	.188	-.017
Interpretive Diversity: Content 7	.359	.636	.218	-.097
Interpretive Diversity: Content 8	.158	.557	.260	.099
Interpretive Diversity: Content 9	.394	.698	.214	-.051
Interpretive Diversity: Frame 1	.727	.272	.073	-.024
Interpretive Diversity: Frame 2	.777	.239	.078	-.042
Interpretive Diversity: Frame 3	.736	.160	.120	-.019
Interpretive Diversity: Frame 4	.761	.169	.097	-.081
Interpretive Diversity: Frame 5	.755	.269	.086	-.078
Interpretive Diversity: Frame 6	.756	.281	-.023	-.064
Interpretive Diversity: Frame 7	.633	.254	.106	-.087
Adaptation1	.069	.143	.680	.162
Adaptation 2	.172	.171	.728	.055
Adaptation 3	.066	.112	.680	.141
Adaptation 4	-.010	.137	.693	.220
Adaptation 5	-.007	.165	.733	.076
Adaptation 6	.162	.267	.661	-.035
Adaptation 7	.109	.121	.694	.144

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 6 iterations.

III.4.C Decision Effectiveness Variables

➢ Decision Quality

TABLE III.4.C1: FACTOR ANALYSIS FOR DECISION QUALITY

Component Matrix

	Items	1
1	The decision made sense in light of the organization's market position.	.782
2	The decision was based on valid assumptions.	.767
3	The decision was made and implemented in a timely manner.	.520
4	The decision was widely supported in the organization.	.675
5	The decision was consistent with the organization's overall marketing strategy.	.725
6	The decision significantly contributed to the overall competitiveness of the organization.	.702
7	The decision was well aligned with the overall strategic objectives of the organization.	.826
8	Overall this was a high quality decision.	.873
Eigenvalue		4.39
Percentage of Variance Explained		54.86

Extraction Method: Principal Component Analysis.
1 component extracted.

TABLE III.4.C2: RELIABILITY ANALYSIS FOR DECISION QUALITY– SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correl	Squared Multiple Correlation	Alpha if Item Deleted
1	The decision made sense in light of the organization's market position.	37.942	49.004	.673	.543	.853
2	The decision was based on valid assumptions.	38.331	48.265	.663	.508	.853
3	The decision was made and implemented in a timely manner.	39.030	49.969	.436	.247	.879
4	The decision was widely supported in the organization.	39.014	46.197	.592	.419	.862
5	The decision was consistent with the organization's overall marketing strategy.	38.325	47.288	.625	.524	.857
6	The decision significantly contributed to the overall competitiveness of the organization.	38.443	48.591	.587	.423	.861
7	The decision was well aligned with the overall strategic objectives of the organization.	38.105	47.285	.732	.641	.847
8	Overall this was a high quality decision.	38.228	45.542	.799	.684	.839

Reliability Coefficients 8 items
Alpha = .873
Standardized item alpha = .878

➢ Decision Creativity

TABLE III.4.C3: FACTOR ANALYSIS FOR DECISION CREATIVITY
Component Matrix

	Items	1
1	The decision was very different from others developed in the past in the organization.	.777
2	The decision broke some of the "rules of the game" within the market.	.681
3	The decision broke some of the "rules of the game" within the company	.712
4	The decision involved creative thinking.	.775
5	The decision was quite novel for the organization.	.855
6	Overall this was an innovative decision.	.847
Eigenvalue		3.624
Percentage of Variance Explained		60.4

Extraction Method: Principal Component Analysis.
1 component extracted.

TABLE III.4.C4: RELIABILITY ANALYSIS FOR DECISION CREATIVITY– SCALE (ALPHA)
Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	CorrecIt em-Total Correl	Squared Multiple Correlation	Alpha if Item Deleted
1	The decision was very different from others developed in the past in the organization.	24.139	44.734	.666	.460	.837
2	The decision broke some of the "rules of the game" within the market.	24.660	43.710	.570	.391	.858
3	The decision broke some of the "rules of the game" within the company	24.103	43.943	.608	.463	.849
4	The decision involved creative thinking.	23.412	46.680	.643	.567	.842
5	The decision was quite novel for the organization.	23.782	43.064	.750	.672	.822
6	Overall this was an innovative decision.	23.643	43.913	.731	.723	.826

Reliability Coefficients 6 items
Alpha = .863
Standardized item alpha = .867

➢ Decision Performance

TABLE III.4.C5: FACTOR ANALYSIS FOR DECISION PERFORMANCE

Component Matrix

	Items	1
1	Overall decision performance compared to expectations.	.762
2	Overall decision success.	.853
3	Positive effect on organizational performance.	.849
4	Net profits relative to expectations	.874
5	Sales relative to expectations	.821
Eigenvalue		3.466
Percentage of Variance Explained		69.317

Extraction Method: Principal Component Analysis.
1 component extracted.

TABLE III.4.C6: RELIABILITY ANALYSIS FOR DECISION PERFORMANCE – SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	CorrecIt em-Total Correl	Squared Multiple Correlation	Alpha if Item Deleted
1	Overall decision performance compared to expectations.	19.535	21.317	.637	.492	.883
2	Overall decision success.	19.321	19.846	.757	.644	.858
3	Positive effect on organizational performance.	19.478	19.026	.748	.605	.859
4	Net profits relative to expectations	19.994	18.921	.794	730	.848
6	Sales relative to expectations	19.878	19.033	.713	.666	.868

Reliability Coefficients 5 items
Alpha = .888
Standardized item alpha = .889

➢ Decision Effectiveness Variables

TABLE III.4.C7: FACTOR ANALYSIS FOR DECISION EFFECTIVENESS VARIABLES
Rotated Component Matrix

	1	2	3
Decision Quality 1	.755	.189	.161
Decision Quality 2	.718	.248	.117
Decision Quality 3	.493	.218	-.013
Decision Quality 4	.665	.177	-.069
Decision Quality 5	.773	.073	-.066
Decision Quality 6	.442	.616	.165
Decision Quality 7	.784	.243	.041
Decision Quality 8	.711	.492	.230
Decision Creativity 1	.088	-.071	.784
Decision Creativity 2	-.072	.196	.666
Decision Creativity 3	-.103	.119	.715
Decision Creativity 4	.249	.151	.736
Decision Creativity 5	-.002	-.035	.870
Decision Creativity 6	.136	.103	.832
Decision Performance 1	.404	.617	.028
Decision Performance 2	.470	.679	.148
Decision Performance 3	.364	.735	.142
Decision Performance 4	.180	.890	.027
Decision Performance 5	.095	.866	.087

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 5 iterations.

III.4.D Control Variables

➢ Decision Complexity

TABLE III.4.D1: FACTOR ANALYSIS FOR DECISION COMPLEXITY
Component Matrix

	Items	1	2	3
1	The way to carry out the major activities involved in this decision was clear. (R)	.219	.148	.768
2	We were fairly certain of what the outcomes of the decision would be. (R)	.082	.096	.840
3	Difficult problems would arise during this decision, for which there were no apparent or immediate solutions.	-.012	.662	.339
4	We spent a lot of time solving problems encountered during this decision.	.003	.861	.052
5	The problems encountered in this decision required extensive and demanding solutions.	.167	.839	.028
6	The process of making and implementing this decision could be described as routine. (R)	.611	.156	.120
7	The issues we encountered in this decision were similar to those encountered in previous decisions. (R)	.686	.187	.129
8	For this decision we relied on established procedures and practices. (R)	.797	-.129	.093
9	The same work methods or steps were followed to resolve issues or problems in this decision as in previous decisions. (R)	.811	-.028	.047
Eigenvalue		2.791	1.827	1.051
Percentage of Variance Explained		31.014	20.295	11.683

TABLE III.4.D2: RELIABILITY ANALYSIS DECISION COMPLEXITY – SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	The way to carry out the major activities involved in this decision was clear. (R)	34.937	53.166	.433	.256	.687
2	We were fairly certain of what the outcomes of the decision would be. (R)	35.004	56.184	.348	.217	.702
3	Difficult problems would arise during this decision, for which there were no apparent or immediate solutions.	34.656	54.952	.360	.293	.700
4	We spent a lot of time solving problems encountered during this decision.	34.430	55.653	.341	.436	.703
5	The problems encountered in this decision required extensive and demanding solutions.	34.429	53.032	.422	.426	.689
6	The process of making and implementing this decision could be described as routine. (R)	33.648	53.958	.401	.242	.693
7	The issues we encountered in this decision were similar to those encountered in previous decisions. (R)	34.267	52.976	.469	.307	.681
8	For this decision we relied on established procedures and practices. (R)	34.066	53.449	.358	.406	.702
9	The same work methods or steps were followed to resolve issues or problems in this decision as in previous decisions. (R)	34.215	53.255	.404	.415	.692

Reliability Coefficients 9 items

Alpha = .719

Standardized item alpha = .720

➢ Environmental Turbulence

TABLE III.4.D3: FACTOR ANALYSIS FOR ENVIRONMENTAL TURBULENCE
Rotated Component Matrix

	Items	1	2	3
1	In our kind of business, customers' product preferences change repeatedly over time.	.056	.191	.813
2	Our customers tend to look for new products all the time.	.212	.152	.819
3	We are witnessing demand for our products and services from customers who never bought them before.	.401	-.136	.553
4	New customers tend to have product-related needs that are different from those of our existing customers.	.241	.026	.592
5	Competition in our industry is cutthroat.	.176	.784	.085
6	There are many "promotion wars" in our industry.	.108	.731	.144
7	Anything that one competitor can offer, others can match readily.	-.010	.727	-.039
8	Price competition is a hallmark of our industry.	-.050	.822	.078
9	The technology in our industry is changing rapidly.	.839	.024	.312
10	Technological changes provide big opportunities in our industry.	.844	.036	.310
11	It is very difficult to forecast where the technology in our industry will be in the next 2 to 3 years.	.659	.112	.016
12	A large number of new product ideas have been made possible through technological breakthroughs in our industry.	.828	.071	.258
Eigenvalue		4.168	2.282	1.173
Percentage of Variance Explained		34.730	19.016	9.773

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 5 iterations.

TABLE III.4.D4: RELIABILITY ANALYSIS FOR ENVIRONMENTAL TURBULENCE – SCALE (ALPHA)

Item-total Statistics

	Items	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
1	In our kind of business, customers' product preferences change repeatedly over time.	51.841	118.572	.483	.486	.793
2	Our customers tend to look for new products all the time.	51.727	116.329	.581	.565	.784
3	We are witnessing demand for our products and services from customers who never bought them before.	51.629	121.933	.422	.377	.798
4	New customers tend to have product-related needs that are different from those of our existing customers.	52.252	121.628	.418	.281	.799
5	Competition in our industry is cutthroat.	50.635	122.736	.451	.443	.796
6	There are many "promotion wars" in our industry.	52.111	119.161	.407	.363	.800
7	Anything that one competitor can offer others can match readily.	51.473	127.837	.246	.295	.814
8	Price competition is a hallmark of our industry.	51.581	123.302	.316	.467	.809
9	The technology in our industry is changing rapidly.	50.740	116.147	.609	.719	.782
10	Technological changes provide big opportunities in our industry.	50.399	115.717	.626	.723	.780
11	It is very difficult to forecast where the technology in our industry will be in the next 2 to 3 years.	51.408	123.318	.383	.224	.801
12	A large number of new product ideas have been made possible through technological breakthroughs in our industry.	50.962	115.154	.593	.625	.782

Reliability Coefficients 12 items

Alpha = .809

Standardized item alpha = .813

➢ Control Variables

TABLE III.4.D5: FACTOR ANALYSIS FOR CONTROL VARIABLES
Rotated Component Matrix

	1	2	3	4	5
Decision Difficulty 3	.084	.032	.011	.044	.726
Decision Difficulty 4	.135	-.030	.069	-.005	.836
Decision Difficulty 5	.118	.090	.099	.159	.789
Decision Variability 6R	.038	-.009	.111	.824	.147
Decision Variability 7R	-.002	-.048	-.057	.699	.208
Decision Variability 8R	-.007	-.091	-.010	.798	-.110
Decision Variability 9R	.092	.000	-.032	.806	-.045
Market Turbulence 1	.043	.175	.795	-.016	.254
Market Turbulence 2	.220	.156	.807	.050	.054
Market Turbulence 3	.439	-.125	.589	-.062	-.104
Market Turbulence 4	.254	.035	.598	.020	-.007
Competitive Intensity 5	.152	.780	.087	.007	.120
Competitive Intensity 6	.117	.733	.135	-.047	.003
Competitive Intensity 7	-.006	.730	-.034	-.025	-.044
Competitive Intensity 8	-.050	.819	.072	-.082	.041
Technological Turbulence 9	.833	.029	.297	.063	.109
Technological Turbulence 10	.841	.045	.295	.089	.085
Technological Turbulence 11	.641	.101	-.003	-.035	.197
Technological Turbulence 12	.830	.080	.237	.079	.061

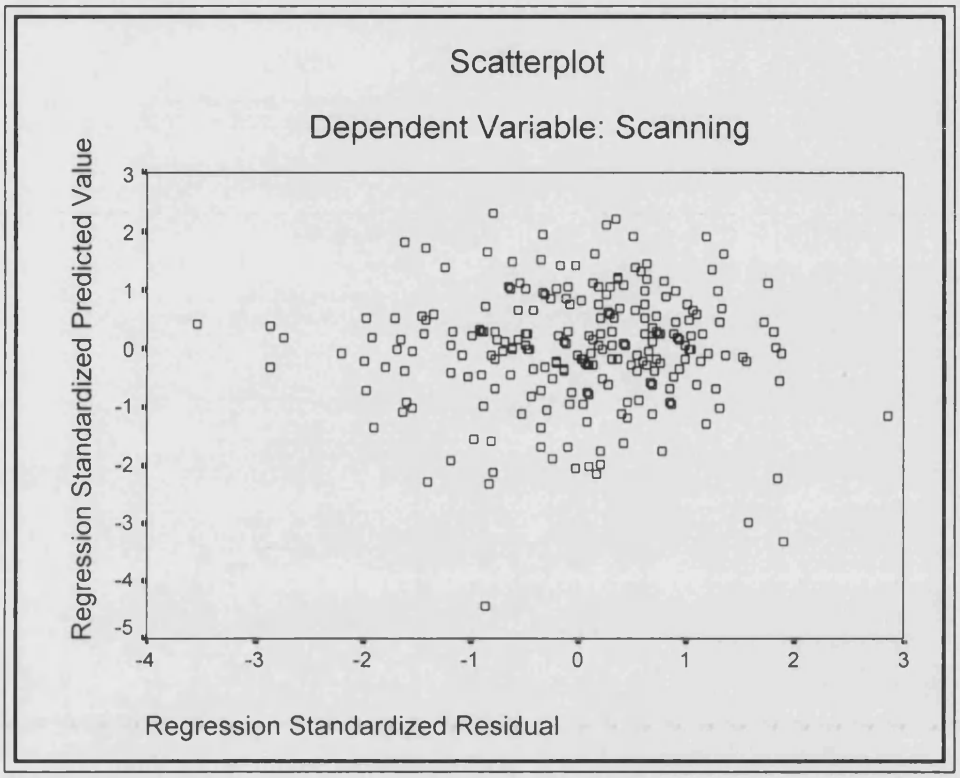
III.4.E Summary Table of Descriptive Statistics

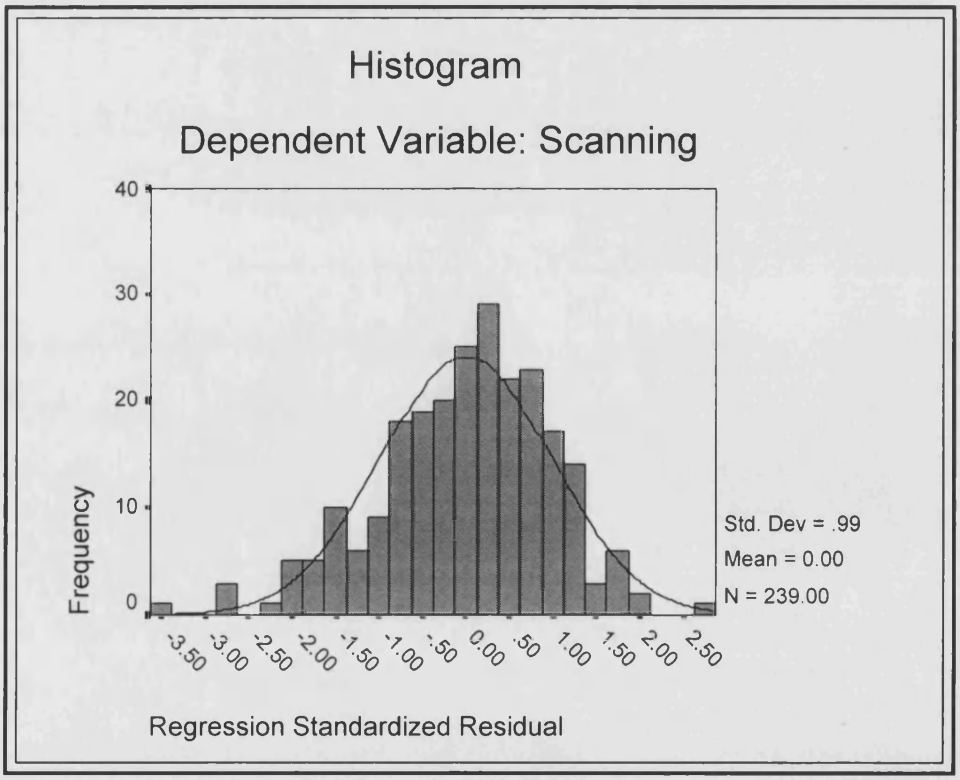
Model Variables	Mean	Median	Mode	Std. Deviation	Skewness	Kurtosis
Centralization	3.773	3.666	3.33	1.191	.243	-.505
Formalization	3.390	3.250	2.50	1.423	.263	-.669
Innovative Culture	4.563	4.660	5.67	1.439	-.329	-.629
Interdepartmental Integration:	5.167	5.200	5.70	1.029	-.769	1.040
Interaction	5.173	5.400	5.60	1.171	-.766	.474
Collaboration	5.17	5.250	5.75	1.225	-.926	1.044
Political Behavior	3.785	3.750	3.25	1.426	.014	-.738
Organizational Memory:	3.819	3.833	4.00	1.316	.000	-.527
Declarative Memory	3.845	4.000	4.00	1.483	-.023	-.804
Procedural Memory	3.793	3.666	3.00	1.582	.075	-.901
Scanning	4.499	4.571	4.43	1.192	-.505	.058
Unified Diversity:	4.570	4.544	4.54	.505	.165	.427
Interpretive Diversity: Content	4.266	4.375	4.50	1.219	-.235	-.465
Interpretive Diversity: Frame	3.125	3.000	2.00	1.156	.386	-.110
Adaptation	4.376	4.428	4.57	1.132	-.401	.143
Decision Quality	5.489	5.625	6.00	.978	-1.138	2.051
Decision Creativity	4.791	5.000	4.83	1.313	-.638	-.062
Decision Performance	4.910	5.000	5.00	1.092	-.599	.394
Decision Complexity	4.462	4.571	4.71	.960	-.158	-.193
Environmental Turbulence	4.672	4.750	5.00	.988	-.371	-.042

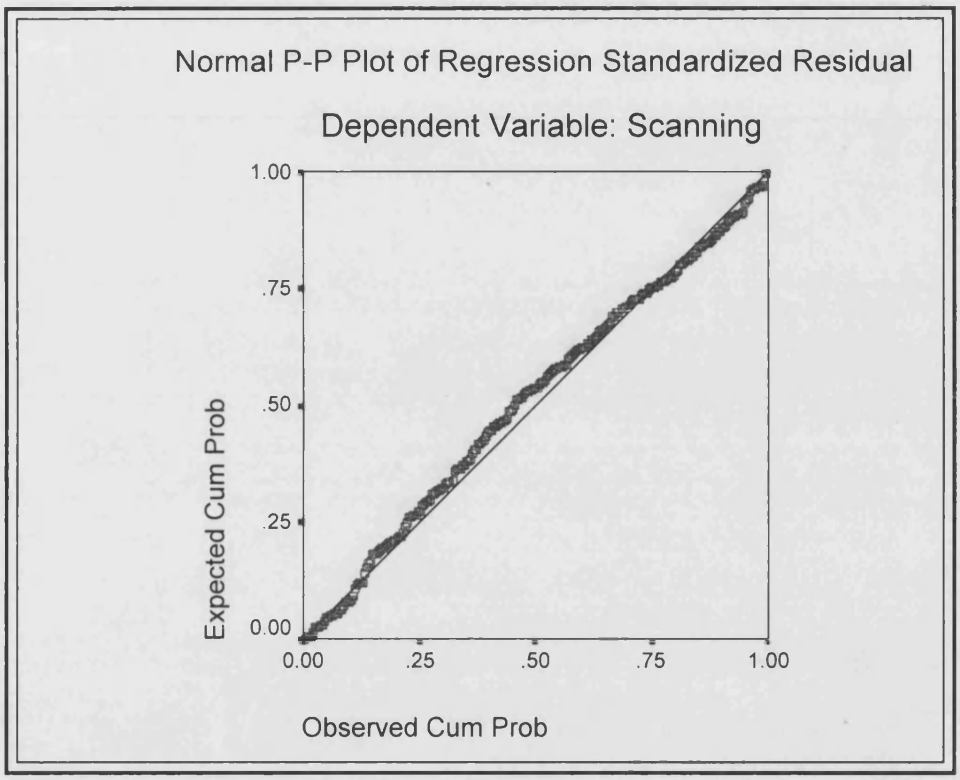
❖ *Appendix III.5: Regression Diagnostics*

III.5.A Learning Process Antecedents – Regression Diagnostics

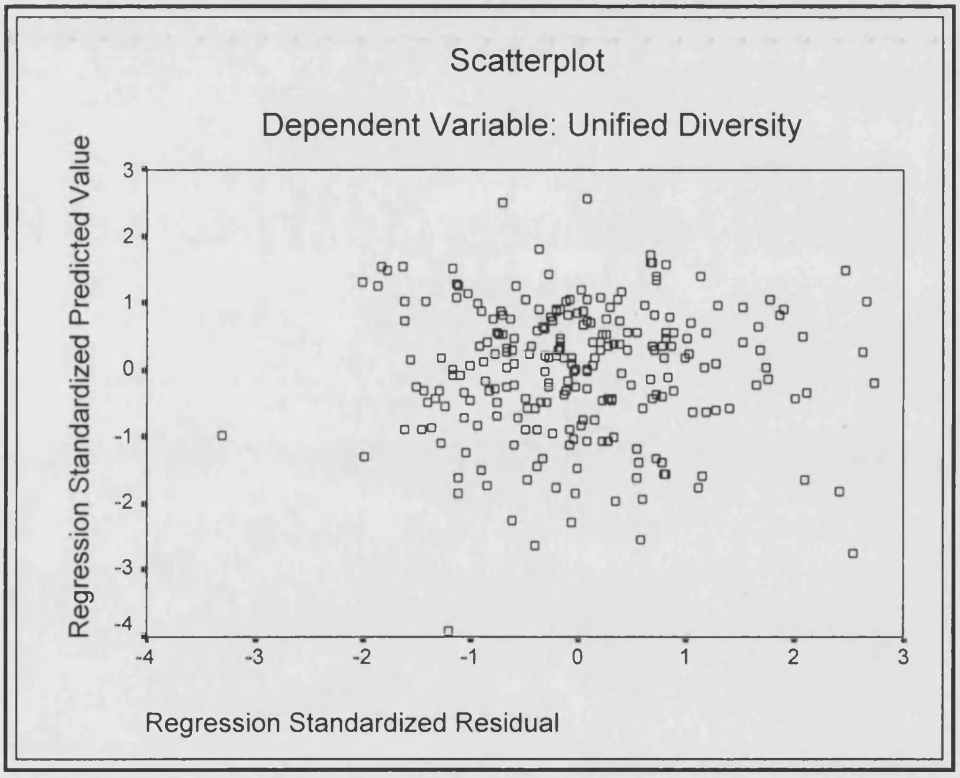
➢ **Scanning**

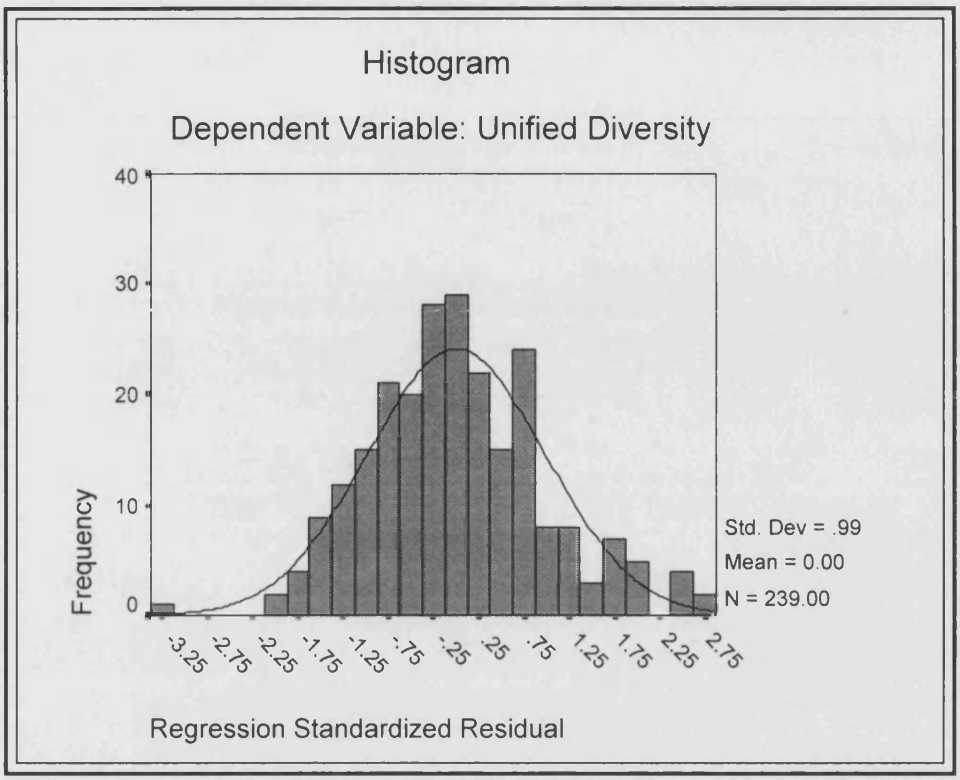


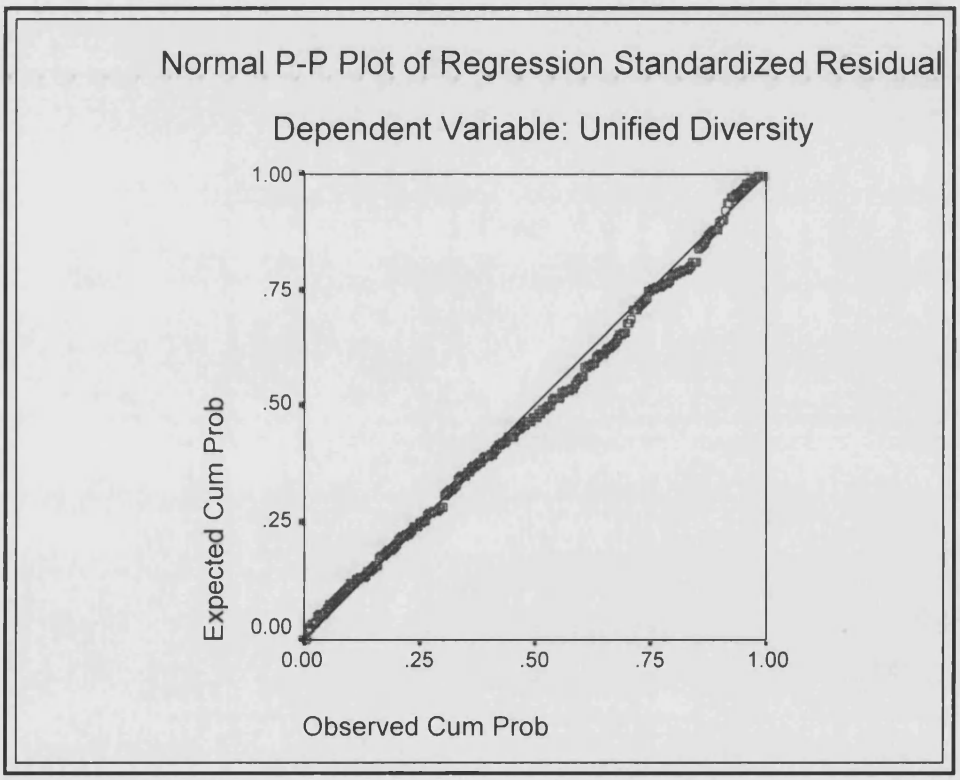




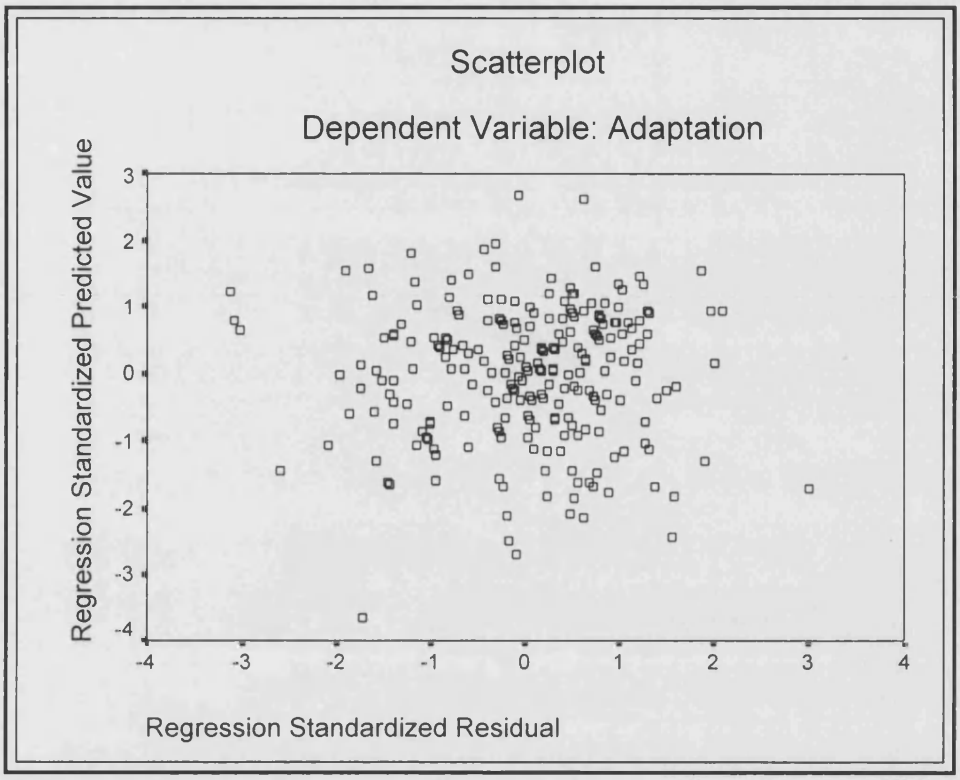
➢ **Unified Diversity**

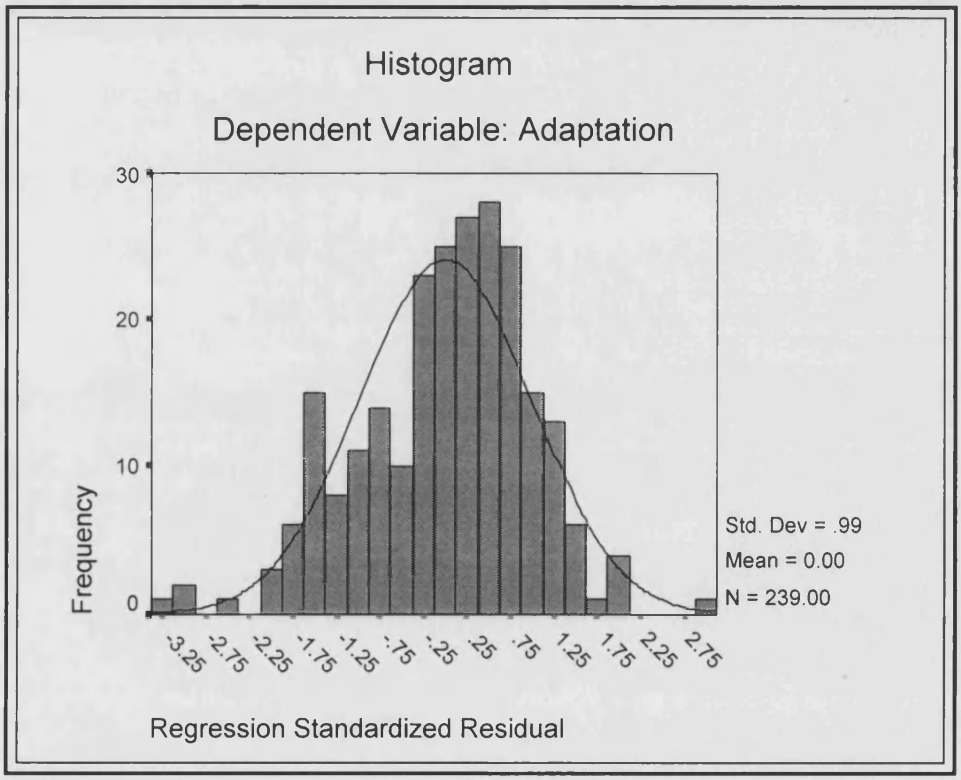


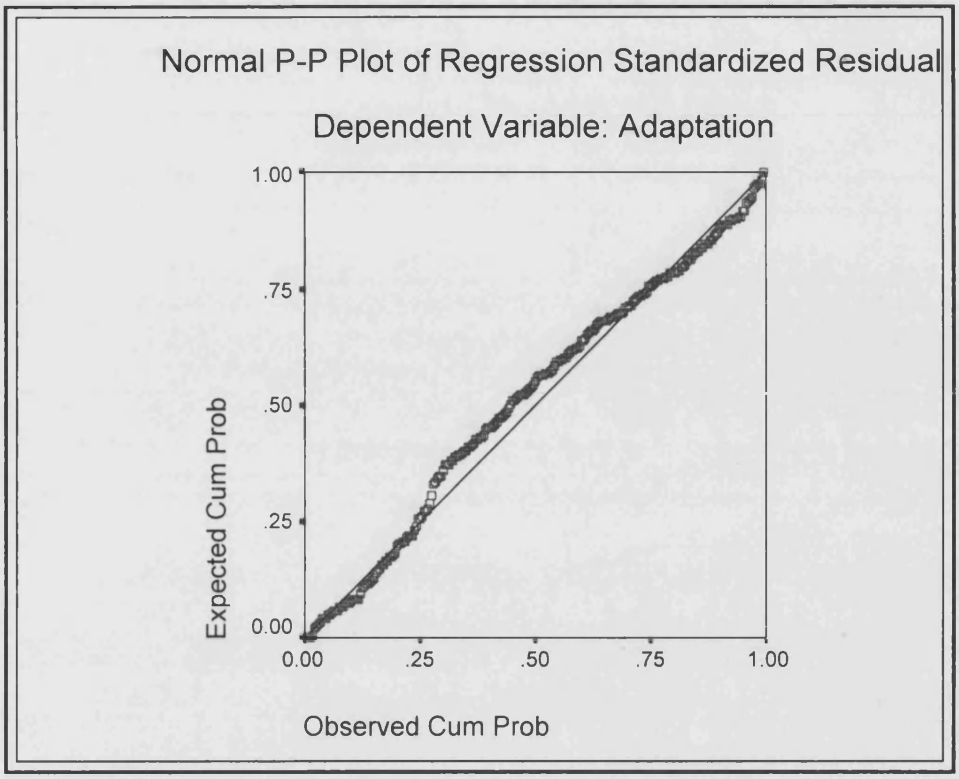

Histogram
Dependent Variable: Unified Diversity
Frequency
40
30
20
10
0
Std. Dev = .99
Mean = 0.00
N = 239.00
-3.25
-2.75
-2.25
-1.75
-1.25
-.75
-.25
.25
.75
1.25
1.75
2.25
2.75
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Unified Diversity
Expected Cum Prob
1.00
.75
.50
.25
0.00
0.00
.25
.50
.75
1.00
Observed Cum Prob

➢ **Adaptation**

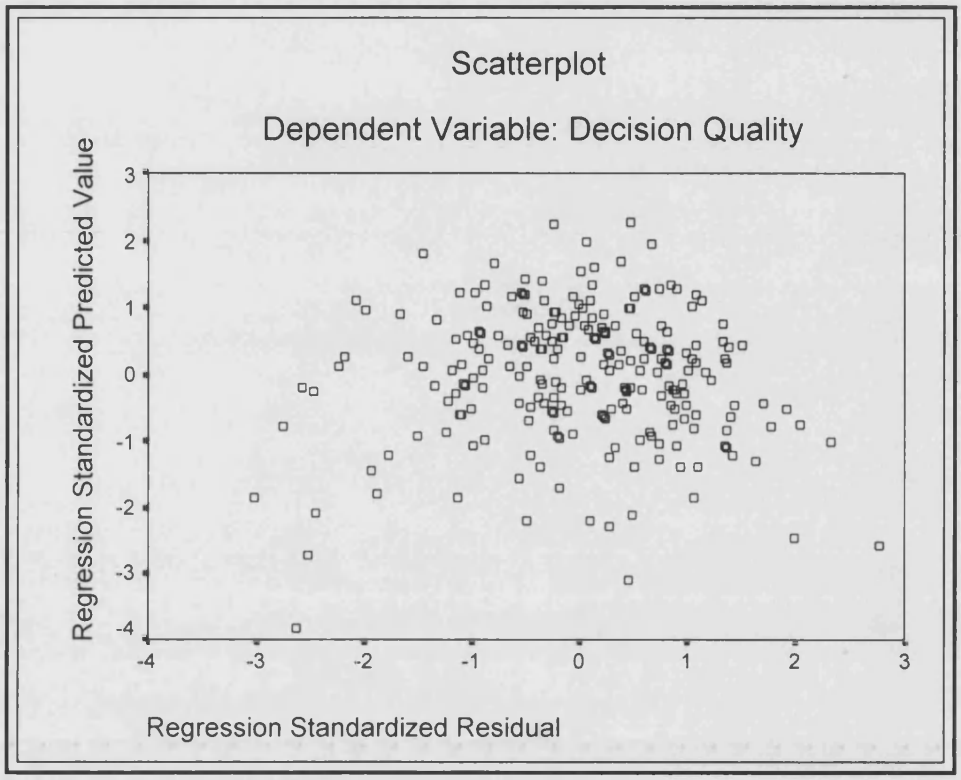

Scatterplot
Dependent Variable: Adaptation
Regression Standardized Predicted Value
3
2
1
0
-1
-2
-3
-4
-4
-3
-2
-1
0
1
2
3
4
Regression Standardized Residual

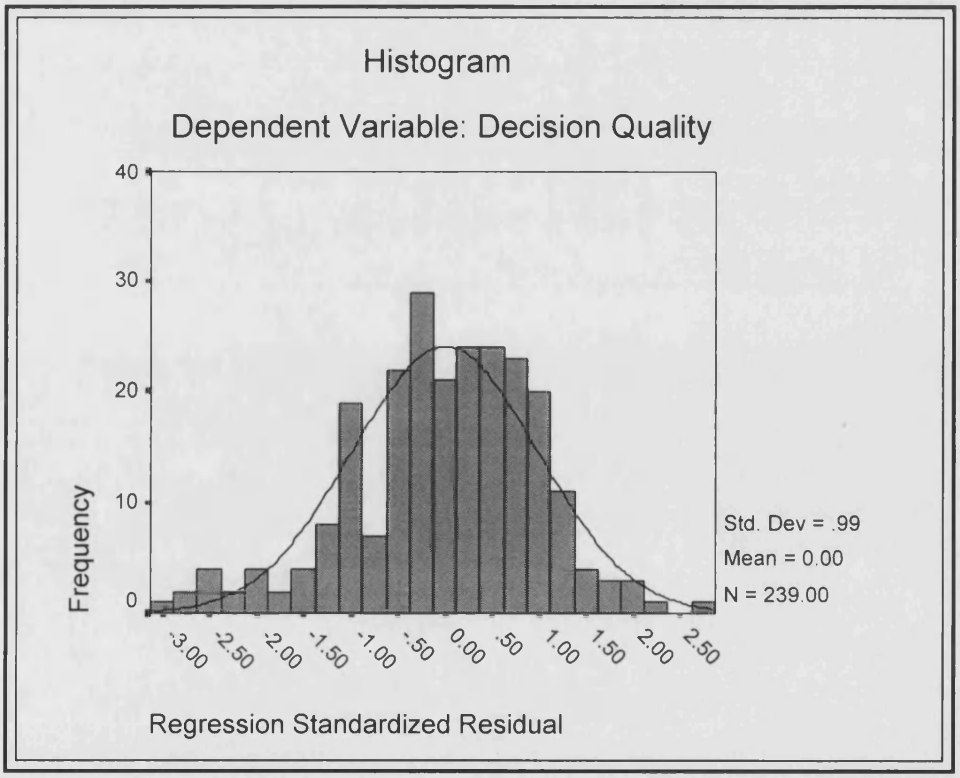

Histogram
Dependent Variable: Adaptation
Frequency
30
20
10
0
Std. Dev = .99
Mean = 0.00
N = 239.00
-3.25
-2.75
-2.25
-1.75
-1.25
-.75
-.25
.25
.75
1.25
1.75
2.25
2.75
Regression Standardized Residual

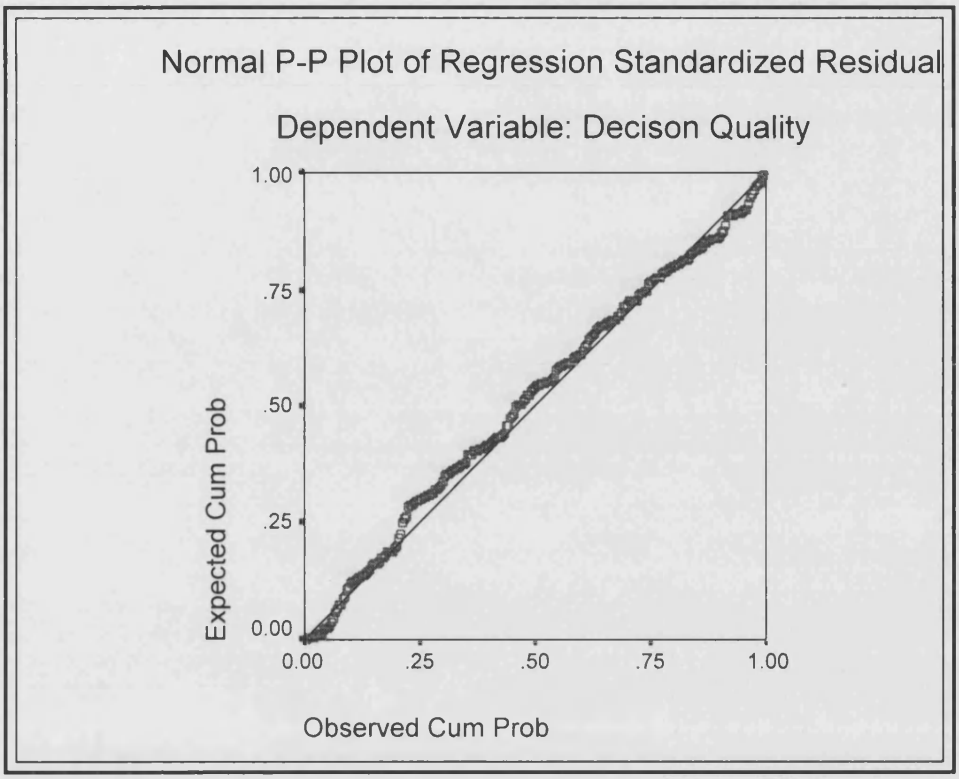

Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Adaptation
Expected Cum Prob
Observed Cum Prob
0.00
.25
.50
.75
1.00

III.5.C Learning Process Outcomes – Regression Diagnostics

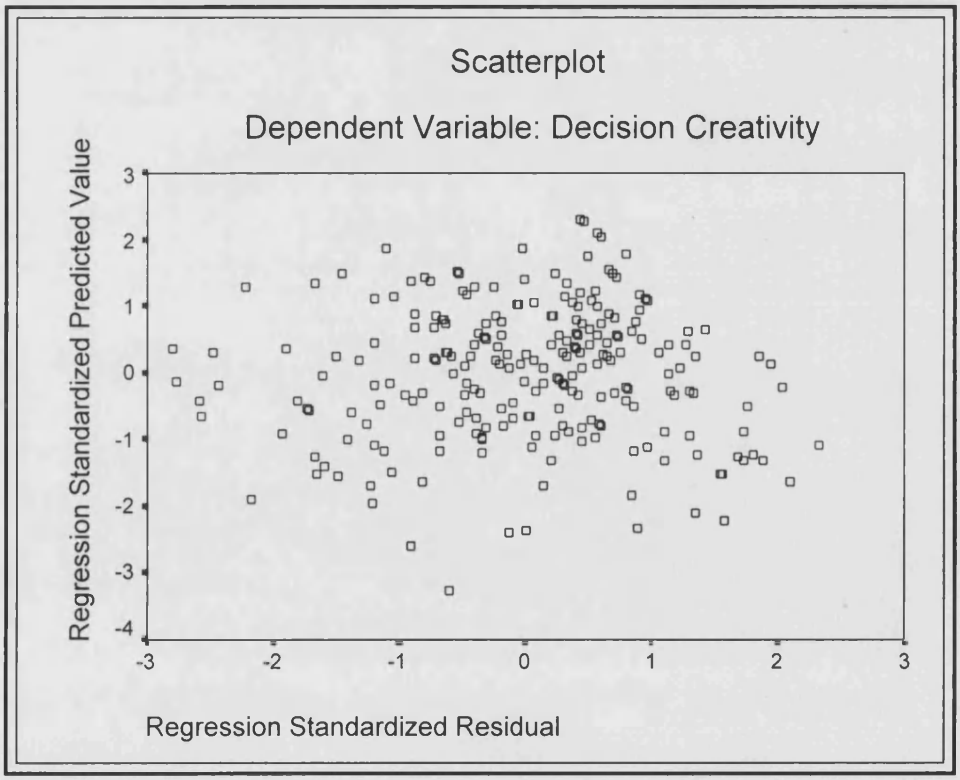
➢ Decision Quality

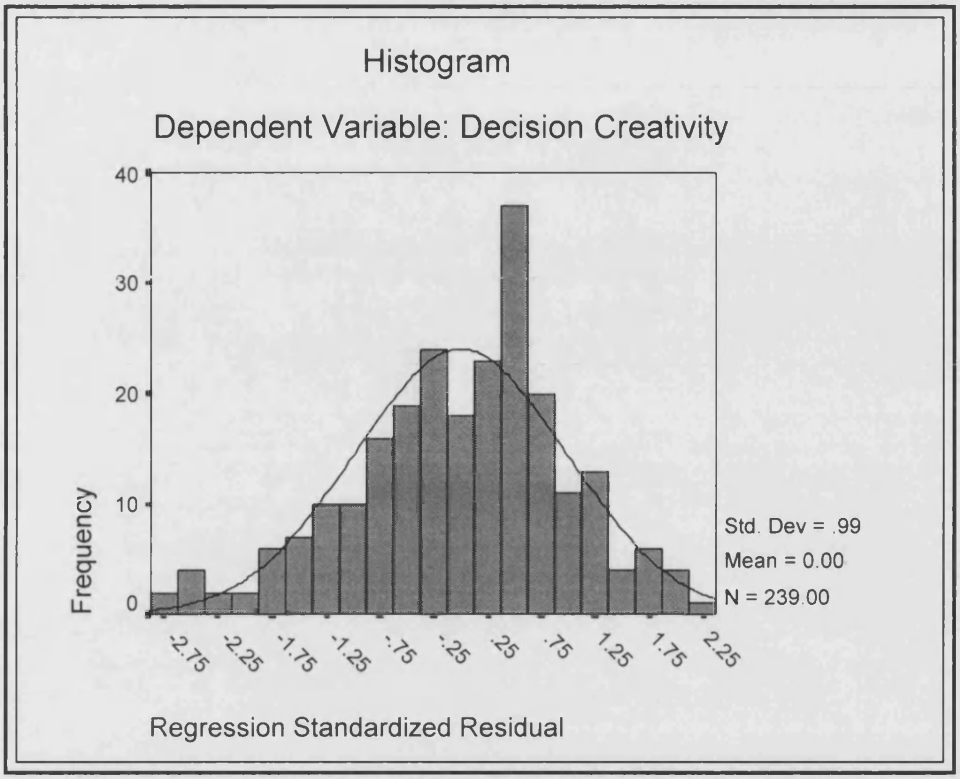


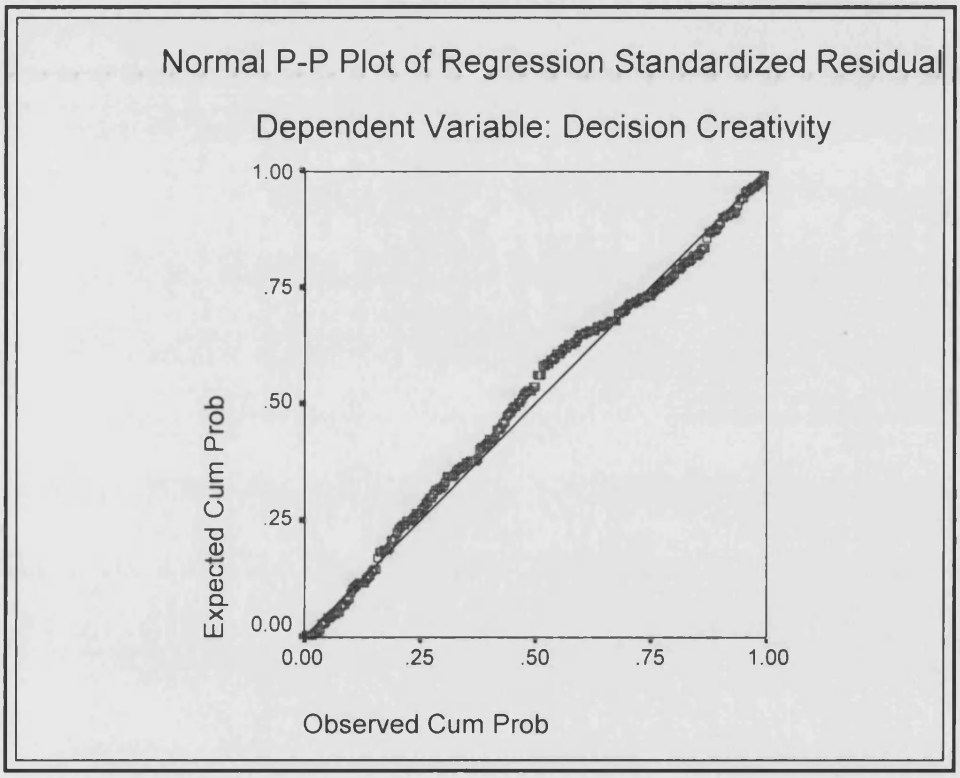




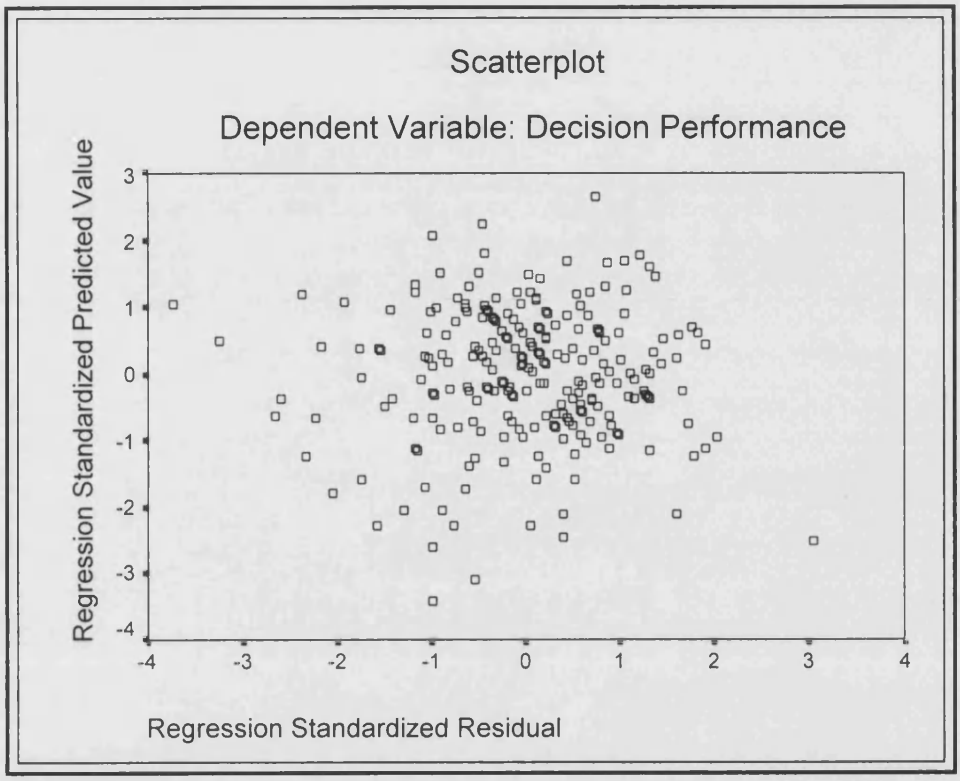
➢ **Decision Creativity**

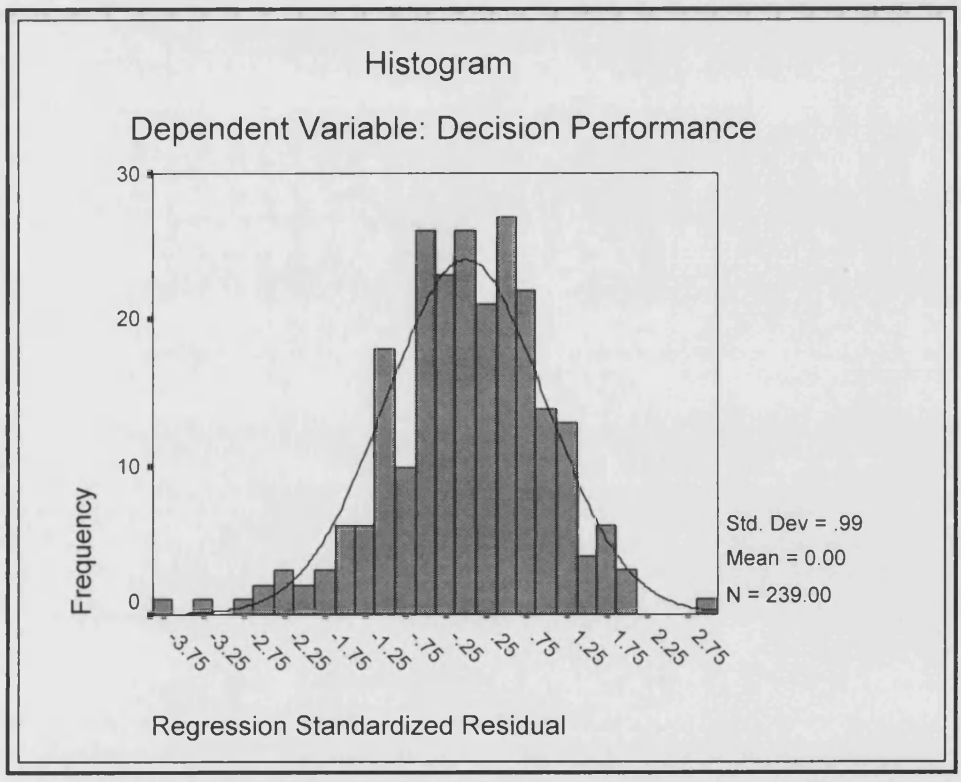


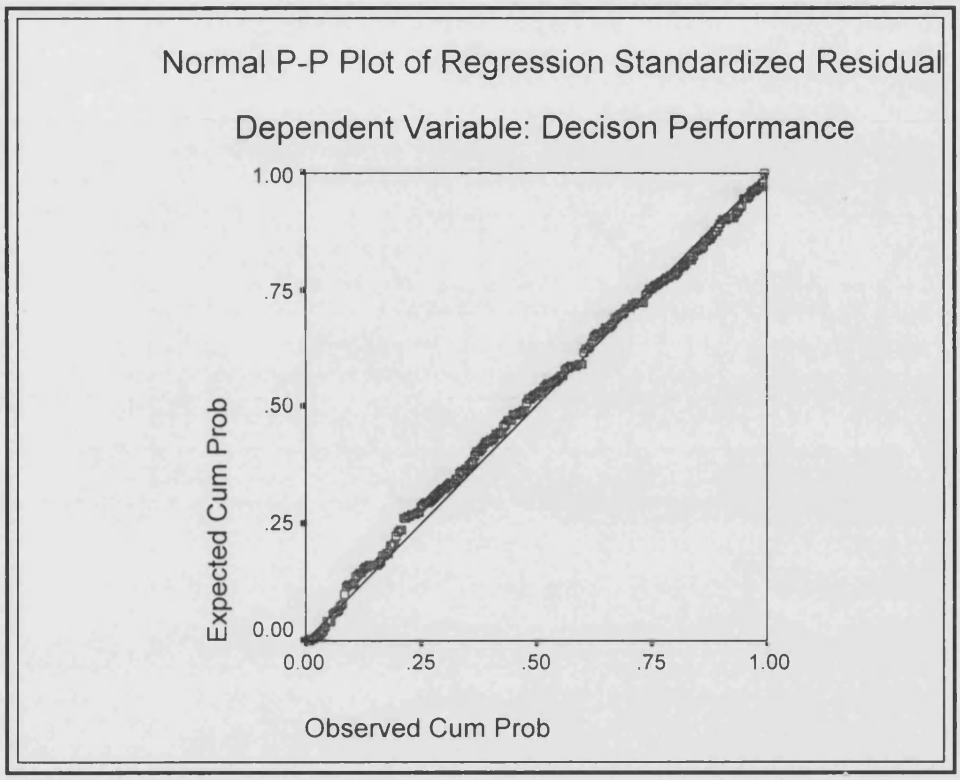

Histogram
Dependent Variable: Decision Creativity
Frequency
40
30
20
10
0
-2.75
-2.25
-1.75
-1.25
-.75
-.25
.25
.75
1.25
1.75
2.25
Std. Dev = .99
Mean = 0.00
N = 239.00
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Decision Creativity
Expected Cum Prob
1.00
.75
.50
.25
0.00
0.00
.25
.50
.75
1.00
Observed Cum Prob

➢ **Decision Performance**






Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Decison Performance
Expected Cum Prob
Observed Cum Prob
0.00
.25
.50
.75
1.00

III.5.C Correlations of Learning Process Predictors

Organizational Context	1	2	3	4	5	6
1. Centralization						
Pearson Correlation	1.000					
Sig. (1-tailed)	.					
2. Formalization						
Pearson Correlation	.069	1.000				
Sig. (1-tailed)	.289	.				
3. Innovative Culture						
Pearson Correlation	-.521**	-.095	1.000			
Sig. (1-tailed)	.000	.141	.			
4. Interdepartmental Integration						
Pearson Correlation	-.562**	.026	.464**	1.000		
Sig. (1-tailed)	.000	.692	.000	.		
5. Political Behavior						
Pearson Correlation	.425**	.129*	-.351**	-.251**	1.000	
Sig. (1-tailed)	.000	.047	.000	.000	.	
6. Organizational Memory						
Pearson Correlation	-.146*	.182**	.202**	.199**	-.041	1.000
Sig. (1-tailed)	.024	.005	.002	.002	.527	.
N	239	239	239	239	239	239

** Correlation is significant at the 0.01 level (1-tailed).

* Correlation is significant at the 0.05 level (1-tailed).

III.5.D Correlations of Decision Effectiveness Predictors

Learning Process	1	2	3	4	5
1. Scanning					
Pearson Correlation	1.000				
Sig. (1-tailed)	.				
2. Unified Diversity					
Pearson Correlation	.273**	1.000			
Sig. (1-tailed)	000	.			
3.Adaptation					
Pearson Correlation	.297**	.287**	1.000		
Sig. (1-tailed)	.000	.000	.		
Decision Complexity					
Pearson Correlation	.097	.155**	.263**	1.000	
Sig. (1-tailed)	.068	.008	.000	.	
Environmental Turbulence					
Pearson Correlation	.283**	.180**	.297**	.158**	1.000
Sig. (1-tailed)	.000	.003	.000	.007	.
N	239	239	239	239	239

** Correlation is significant at the 0.01 level (1-tailed).